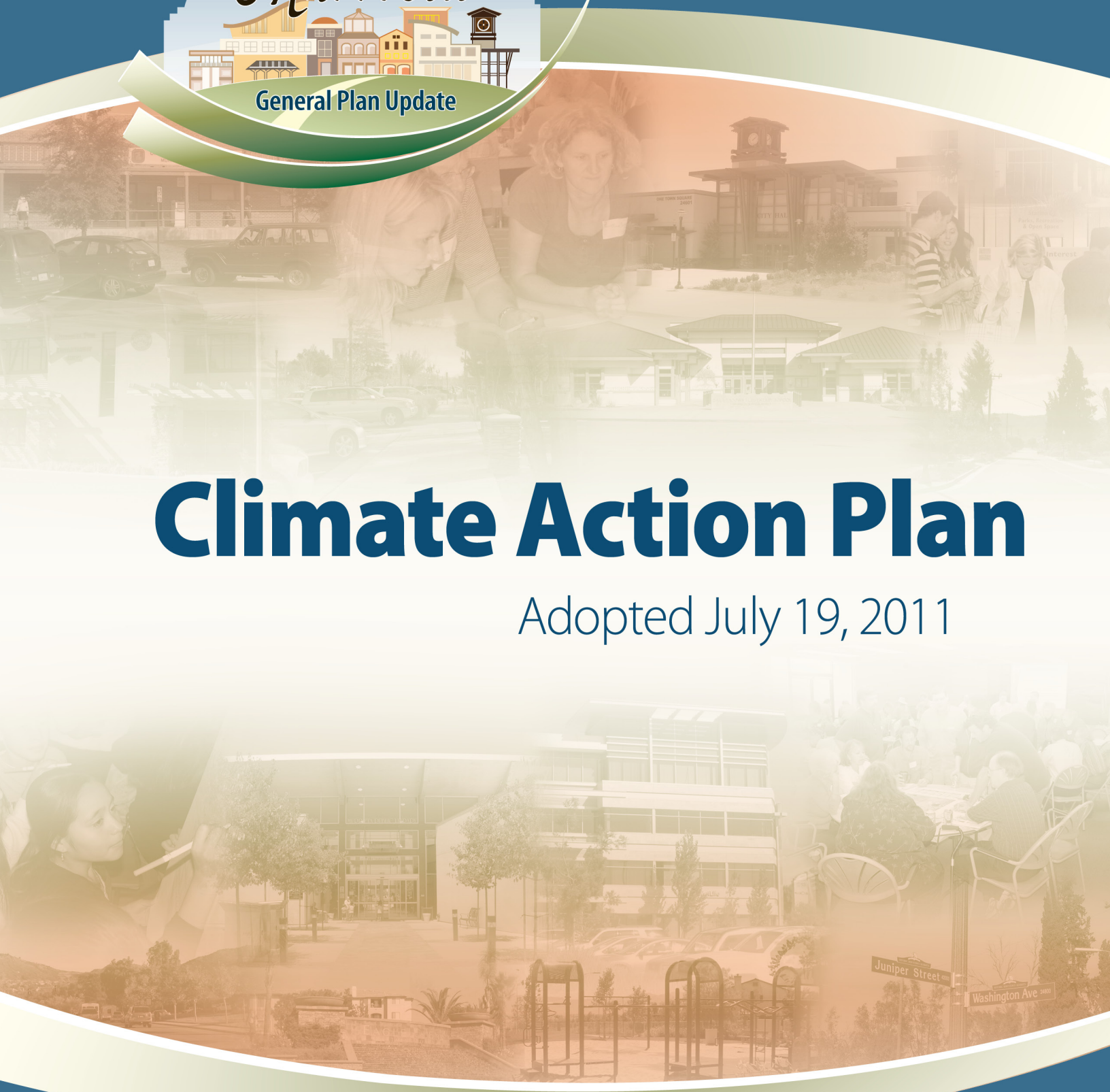
Appendix P:

Climate Action Plan

the future of southern california
Murrieta
General Plan Update



Climate Action Plan

Adopted July 19, 2011

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Chapter 1
Introduction

Chapter 1 Introduction

PURPOSE OF THE CLIMATE ACTION PLAN

In order to aggressively address the threats of global climate change, the City has prepared a Climate Action Plan (CAP), which provides a framework for reducing GHG emissions and managing resources to best prepare for a changing climate. The CAP recommends GHG emissions targets that are consistent with the reduction targets of the State of California and presents a number of strategies that will make it possible for the City to meet the recommended targets. The CAP also suggests best practices for implementation and makes recommendations for measuring progress.

The CAP is intended to address the main sources of the emissions that cause climate change, which include emissions from the energy consumed in buildings and for transportation, as well as the solid waste sent to landfills. The purpose of the CAP is to guide the development, enhancement, and ultimately the implementation of actions that will reduce Murrieta's GHG emissions by 15 percent below existing levels. The CAP has been designed to support the following functions:

- Describe Murrieta's emissions sources;
- Provide projections of future emissions based on growth;
- Provide clear guidance to City staff regarding when and how to implement key provisions of the plan;
- Recommend strategies and actions to achieve GHG reductions;
- Demonstrate Murrieta's commitment to comply with State GHG reduction efforts; and
- Define a strategy for turning this plan into action and transparently tracking and reporting progress toward the GHG reduction goals.

RELATIONSHIP TO THE GENERAL PLAN

The CAP implements policies that have been identified in the Land Use, Economic Development, Circulation, Infrastructure, Healthy Community, Conservation, Recreation and Open Space, and Air Quality Elements of the Murrieta General Plan Update. The General Plan Update includes specific goals and policies that guide the City's approach to climate change, including emissions reductions targets, guidelines for preparing inventories or plans, and general reduction strategies. As climate change is a cross-cutting issue addressed by many elements of the General Plan, the CAP as a whole is considered an implementation measure for the policies described in this CAP. This structure allows the City to update the CAP on an on-going, as-needed basis to ensure that the City's climate protection efforts reflect both current legislation and emerging best practices.

RELATIONSHIP TO CALIFORNIA ENVIRONMENTAL QUALITY ACT

The City's approach to addressing GHG emission reductions within the General Plan Update is parallel to the climate change planning process being followed by more than 50 other California jurisdictions. This process includes:

- Completing a baseline GHG emissions inventory and projecting future emissions;
- Identifying a community‐wide GHG reduction target;
- Preparing a CAP to identify strategies and measures to meet the reduction target;
- Identifying targets and reduction strategies in the General Plan and evaluating the environmental impacts of the CAP in the General Plan Environmental Impact Report (EIR);
- Monitoring effectiveness of reduction measures and adapting the plan to changing conditions; and
- Adopting the CAP in a public process following environmental review.

This approach is consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5 that allows jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level, by adopting a plan for the reduction of GHG emissions.

One of the primary uses for a CAP is to establish significance thresholds for reviewing projects under CEQA. CEQA requires the City to identify the significant environmental impacts of its discretionary actions and to avoid or mitigate those impacts if feasible. The CEQA Guidelines, as updated pursuant to Senate Bill (SB) 97, acknowledges that climate change is an environmental issue that requires analysis under CEQA and encourages the use of a plan consistency threshold for cumulative impacts on climate change. Projects that demonstrate consistency with the strategies, actions, and emission reduction targets contained in the CAP would have a less than significant impact on climate change.

When the City undertakes a discretionary action, such as approval of a proposed development project, plan, policy, or code change, the City will evaluate whether that action would result in a significant climate change impact.

Adoption of the CAP itself by the City is considered a project under CEQA. The overall purpose of the CAP is to reduce the impact that the community will have on global climate change to reduce the impact on the environment. However, implementation of the CAP could potentially result in adverse impacts on the physical environment, such as degrading visual resources, biological resources, or cultural resources. The potential impacts of the CAP are being evaluated as part of the EIR for the Murrieta General Plan Update. With completion and adoption of the General Plan Update EIR, the CAP will have undergone environmental review under CEQA. The CAP is intended to reduce the City's impact on climate change; therefore, determining the consistency of a proposed project with the CAP is one way to evaluate whether a project would have a significant climate change impact.

When determining whether a proposed project is consistent with the CAP, the following should be considered:

- The extent to which the project supports or includes applicable strategies and measures, or advances the actions identified in the CAP;
- The consistency of the project with the Murrieta General Plan Update population growth projections, which are the basis of the GHG emissions inventory projections;
- The consistency of the project with the emission reduction targets set by the CAP; and
- The extent to which the project would interfere with implementation of CAP strategies, measures, or actions.

The emission reduction targets are a critical factor in determining CAP consistency. Therefore, the CAP target must be set at a level that demonstrates consistency with State targets, but should be feasible for the vast majority of projects to achieve. If the reduction target percentage is set at a level that is infeasible, EIRs could be required for a large number of projects. A statement of overriding considerations would be required and no additional emission reductions would be achieved if feasible emission reductions were not available.

If the City determines in its environmental review that the proposed project would conflict with the CAP, the City would be required to incorporated mitigation measures, where feasible, within the proposed project to minimize its GHG emissions and/or climate change impact. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant unavoidable impact and the City has the option to adopt a statement of overriding considerations as described in Section 15093 of the State CEQA Guidelines.

PUBLIC PARTICIPATION

City of Murrieta residents and business leaders participated in the formulation of the CAP through participation in General Plan Update community workshops. The General Plan Update is being completed simultaneously with this CAP. Community members have provided valuable input that has been used to select GHG reduction measures.

The City conducted three General Plan community visioning workshops in January 2010. On January 22, 2010, the City held a workshop and collected input from 48 students from Vista Murrieta High School. On January 28 and 30, 2010, the City held workshops which were attended by over 60 community members. Ten meetings were held between March and June which focused on community involvement in the development of the Land Use Alternatives in each of the focus areas and to refine the vision and community priorities. Opinions were also gathered through several online surveys throughout the General Plan Update process. Community members participated in small group discussion and presentation sessions, 'Treasures, Challenges, and Visions' Post-it Note exercise, surveys, and entire room discussions. The information gathered from these meetings and surveys were used in the General Plan Update and to formulate goals and policies for the CAP.

GREENHOUSE EFFECT AND GREENHOUSE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect."[1] The greenhouse effect traps heat in the troposphere through a three-fold process, summarized as follows: short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. This process is illustrated in Exhibit 1, *The Greenhouse Effect*.

The most abundant GHGs are water vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential for each GHG based on its ability to absorb and re-radiate long wave radiation. The Global Warming Potential of a gas is determined using carbon dioxide as the reference gas with a Global Warming Potential of one (1).

GHGs normally associated with a proposed project include the following:[2]

- **Water Vapor (H_2O).** Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

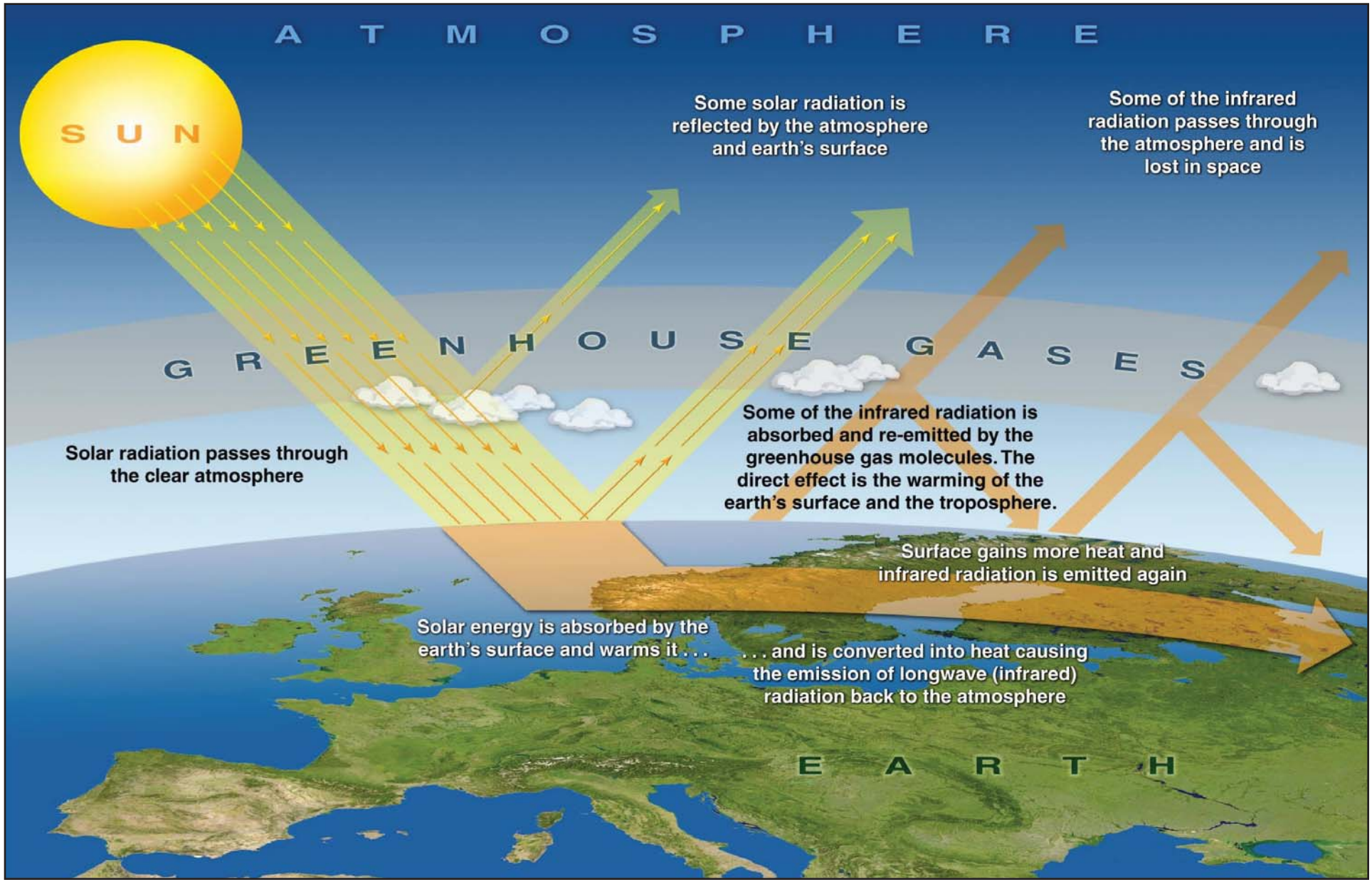
  The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

- **Carbon Dioxide (CO_2).** CO_2 is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of CO_2 in the atmosphere has increased 36 percent.[3] CO_2 is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

[1] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

[2] All Global Warming Potentials are given as 100 year GWP. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. Climate Change (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

[3] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2008*, April 2010.


ATMOSPHERE
SUN
Some solar radiation is reflected by the atmosphere and earth's surface
Some of the infrared radiation passes through the atmosphere and is lost in space
GREENHOUSE GASES
Solar radiation passes through the clear atmosphere
Some of the infrared radiation is absorbed and re-emitted by the greenhouse gas molecules. The direct effect is the warming of the earth's surface and the troposphere.
Surface gains more heat and infrared radiation is emitted again
Solar energy is absorbed by the earth's surface and warms it . . .
. . . and is converted into heat causing the emission of longwave (infrared) radiation back to the atmosphere
EARTH

NOT TO SCALE

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CLIMATE ACTION PLAN

The Greenhouse Effect

Exhibit 1

- **Methane (CH_4).** CH_4 is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of CH_4 are landfills, natural gas systems, and enteric fermentation. CH_4 is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of CH_4 is 21.

- **Nitrous Oxide (N_2O).** N_2O is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N_2O is 310.

- **Hydrofluorocarbons (HFCs).** HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.[4]

- **Perfluorocarbons (PFCs).** PFCs are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semi conductor manufacturing. PFCs are potent GHGs with a GWP several thousand times that of CO_2, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).[5] The GWP of PFCs range from 6,500 to 9,200.

- **Sulfur hexafluoride (SF_6).** SF_6 is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).[6]

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric O_3 depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- **Hydrochlorofluorocarbons (HCFCs).** HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent

[4] U.S. Environmental Protection Agency, *High GWP Gases and Climate Change*, June 22, 2010.

[5] Ibid.

[6] Ibid.

reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.[7]

- **1,1,1 trichloroethane.** 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 110 times that of CO_2.[8]

- **Chlorofluorocarbons (CFCs).** CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the U.S. Environmental Protection Agency's (EPA) Final Rule (57 FR 3374) for the phase out of O_3 depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,600 for CFC 11 to 14,000 for CFC 13.[9]

GLOBAL GHG EMISSIONS

Atmospheric data for GHG concentrations over the past 800,000 years demonstrates that concentrations of CO_2 (which comprises the majority of GHG emissions) have increased since pre-industrial times. Concentrations have increased from approximately 280 parts per million (ppm) to approximately 353 ppm in 1990, and to approximately 379 ppm in 2005.

In 2000, the United Nations International Panel on Climate Change (IPCC) outlined potential global emission scenarios for the coming century. The scenarios vary from a best case scenario with a low population growth, clean technologies, and low GHG emissions, to a worst case scenario of a high population growth and fossil fuel dependence resulting in extreme levels of GHG emissions. While some degree of climate change is inevitable, most climate scientists agree that in order to avoid dangerous climate change, atmospheric GHG concentrations should be stabilized at 350 to 400 ppm.

NATIONWIDE GHG EMISSIONS

Based data produced by the EPA's *2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks*, GHG emissions in the United States were 6,956.8 teragrams (Tg) CO_2eq[10] in 2008.[11] As

[7] U.S. Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, November 7, 2006.

[8] Ibid.

[9] U.S. Environmental Protection Agency, *Class I Ozone Depleting Substances*, March 7, 2006.

[10] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

[11] U.S. Environmental Protection Agency, *2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks*, 2010.

indicated by the EPA, total nationwide emissions have risen by approximately 14 percent from 1990 to 2008. Emissions declined from 2007 to 2008, decreasing by 2.9 percent (211.3 Tg CO_2eq.). This decrease is primarily a result of a decrease in demand for transportation fuels associated with the record high costs of these fuels that occurred in 2008. Additionally, electricity demand declined in 2008 in part due to a significant increase in the cost of fuels used to generate electricity. In 2008, temperatures were cooler in the United States than in 2007, both in the summer and the winter. This lead to an increase in heating related energy demand in the winter, but much of this increase was offset by a decrease in cooling related electricity demand in the summer. Overall, from 1990 to 2008 total GHG emissions increased by 820.4 Tg CO_2eq (16.1 percent), while CH_4 and N_2O emissions decreased by 45.8 Tg CO_2eq (7.5 percent) and 4.1 Tg CO_2eq (1.3 percent), respectively.

STATEWIDE GHG EMISSIONS

In May 2010, the California Air Resources Board (CARB) prepared a GHG inventory that compiles statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, nitrogen trifluoride (NF_3), HFCs, and PFCs for the years 2000 through 2008. According to the CARB GHG emission inventory estimates, California emitted approximately 474 million metric tons (MMT) of CO_2eq emissions in 2008.[12] California's total GHG emissions are larger than every other state with the exception of Texas. However, California has a relatively low carbon emission intensity. In 2001, California ranked the fourth lowest per-capita CO_2 emissions from fossil fuel combustion in the country, due to the success of its energy efficiency and renewable energy programs. California's energy programs and policies have had multiple benefits that include not only reducing GHG emissions, but reducing energy demand and improving air quality and public health.[13] If emissions continue to increase at business as usual (BAU)[14] rates, statewide emissions are expected to increase to approximately 600 metric tons (MT) CO_2eq by 2020, which represents a 40 percent increase above 1990 levels. In order for the State to participate in global efforts to avoid dangerous climate change, California's GHG emissions need to be reduced to at least 1990 levels by 2020 and 80 percent below 1990 levels by 2050.

GLOBAL EFFECTS OF CLIMATE CHANGE

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2 degrees Celsius per decade, determined from meteorological measurements

[12] California Air Resources Board, *Greenhouse Gas Inventory Data - 2000 to 2008*, May 28, 2010.

[13] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF*, January 23, 2007.

[14] "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See http://www.arb.ca.gov/cc/inventory/data/forecast.htm. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

worldwide between 1990 and 2005.[15] Climate change modeling using year 2000 emission rates shows that further warming would occur, which would include further changes in the global climate system during the current century.[16] Changes to the global climate system and ecosystems and to California would include, but would not be limited to:

- The loss of sea ice and mountain snow pack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[17]
- Rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps and the Greenland and Antarctic ice sheets;[18]
- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[19]
- Decline of the Sierra snow pack (which accounts for approximately half of the surface water storage in California) by 70 percent to as much as 90 percent over the next 100 years;[20]
- Increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century;[21] and
- High potential for erosion of California's coastlines and sea water intrusion into the Delta and levee systems due to the rise in sea level.[22]

While there is broad agreement on the causative role of GHGs to climate change, there is considerably less information or consensus on how climate change would affect any particular location, operation, or activity. The IPCC has published numerous reports on potential impacts

[15] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007.

[16] Ibid.

[17] Ibid.

[18] Ibid.

[19] Ibid.

[20] California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature (Executive Summary)*, March 2006.

[21] Ibid.

[22] Ibid.

of climate change on the human environment. These reports provide a comprehensive and up-to-date assessment of the current state of knowledge on climate change. Despite the extensive peer review of reports and literature on the impacts of global climate change, the IPCC notes the fact that there is little consensus as to the ultimate impact of human interference with the climate system and its causal connection to global warming trends.

LOCAL EFFECTS OF CLIMATE CHANGE

The following climate change effects could affect the City. However, the type and degree of the impacts that climate change would have on humans and the environment is difficult to predict at the local scale.

- **Sea Level Rise.** According to the IPCC, climate change is expected to raise sea levels by up to four feet. The City of Murrieta is approximately 22 miles from the Pacific Ocean and ranges from approximately 1,050 feet above mean sea level (msl) to 1,700 feet above msl. Sea levels are anticipated to rise 12 to 18 inches by 2050.[23] Therefore, sea level rise of this magnitude would be unlikely to inundate the City. Additionally, the effects related to sea level rise are speculative at this time. However, if determined to be a significant threat, protective measures such as levees would likely be installed by regional and local governments to protect urbanized areas.

- **Water Supply.** The City receives some of its water supplies from the State Water Project through the Metropolitan Water District of Southern California (MWD). Surface water supplies in the City from the State Water Project could potentially be reduced as a result of climate change effects.[24] Climate change could also impact groundwater supplies. Warmer temperatures could lead to higher evaporation or shorter rainfall seasons, which would mean that soil deficits would persist for longer time periods. Higher evapotranspiration would likely reduce the amount of water available for recharge and can lead to greater pumping of groundwater to make up for losses in surface water.[25] Groundwater serves as a source of water supply in Murrieta, which could result in serious implications for water supply in the City.

- **Natural Disasters.** Climate change could result in increased flooding and weather-related disasters. The City is located approximately 22 miles from the Pacific Ocean and would not be exposed to intense coastal storms. The frequency of large floods on rivers and streams could also increase. However, the City is not expected to be impeded by flood flows from Murrieta Creek or be susceptible to increased flooding; thus, flood-related impacts would be less than significant even under an intensified flooding scenario.

[23] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

[24] California Department of Water Resources, *Progress on Incorporating Climate Change into Management of California's Water Resources*, July 2006.

[25] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

- **Wildfires.** Climate change could result in increased occurrences and duration of wildfire events due to warmer temperatures, longer dry seasons, reduced winter precipitation, and early snowmelt. The City is located within areas designated by the California Department of Forestry and Fire Protection (CalFire) as Very High Fire Hazard Severity Zones (VHFHSZ) and Non-VHFHSZ. Development within the VHFHSZ is required to meet strict building construction requirements specified in the California Building Code Chapter 7A which would substantially reduce the risk and significance of wildland fires.

- **Public Health.** Climate change could cause an increase in infections, disease, asthma, and other health-related problems.[26] Heat waves are expected to have a major impact on public health as well as decreasing air quality and an increase in mosquito breeding and mosquito-borne diseases. Vector control districts throughout the State are already evaluating how they will address the expected changes to California's climate.[27]

- **Air Quality.** Climate change would compound negative air quality impacts in the South Coast Air Basin, resulting in respiratory health impacts.[28] The California Climate Adaptation Strategy states that climate change influences on atmospheric processes will promote formation of ground-level pollutants, such as ozone and secondary aerosols (particulate matter), and that these increases could offset much of the potential gains achieved through air pollution control measures. However, this would be a regional effect.

Other predicted physical and environmental impacts associated with climate change include heat waves, alteration of disease vectors, biome shifts, impacts on agriculture and the food supply, reduced reliability in the water supply, and strain on the existing capacity of sanitation and water-treatment facilities. While these issues are a concern for society at large, none of these impacts would have a disproportionate effect on the City of Murrieta. However, Chapter 3, *Climate Action Strategies*, identifies actions and strategies aimed at reducing the effects of climate change on the City.

LEGISLATION AND REGULATORY CONTEXT

Federal

The Federal Clean Air Act (FCAA) requires the EPA to define national ambient air quality standards (national standards) to protect public health and welfare in the United States. The FCAA does not specifically regulate GHG emissions; however, on April 2, 2007 the U.S. Supreme Court in *Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the FCAA. The EPA adopted an endangerment finding and cause or contribute finding for GHGs on December 7, 2009. The

[26] California Climate Change Center, *Our Changing Climate, Assessing the Risks to California,* July 2006.

[27] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

[28] California Environmental Protection Agency, *AB 1493 Briefing Package*, 2008.

final findings were published in the Federal Register on December 15, 2009 under Docket ID No. EPA-HQ-OAR-2009-0171. The final rule was effective January 14, 2010.

Under the endangerment finding, the Administrator found that the current and projected atmospheric concentrations of the six, key, well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. Under the cause of contribute finding, the Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Based on these findings, on April 1, 2010, the EPA finalized the light-duty vehicle rule controlling GHG emissions. This rule confirmed that January 2, 2011, is the earliest date that a 2012 model year vehicle meeting these rule requirements may be sold in the United States. On May 13, 2010, the EPA issued the final GHG Tailoring Rule. This rule set thresholds for GHG emissions that define when permits under the Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. Currently, EPA rules do not cover residential construction projects. Implementation of the Federal rules is expected to reduce the level of emissions from new motor vehicles and large stationary sources. The EPA annually publishes the *Inventory of U.S. Greenhouse Gas Emissions and Sinks* for estimating sources of GHGs that is generally consistent with the IPCC methodology developed in its *Guidelines for National Greenhouse Gas Inventories*.

State of California

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come into play in the past decade.

ASSEMBLY BILL 1493

In 2002, then-Governor Gray Davis signed AB 1493 (Chapter 200, Statutes of 2002, amending Section 42823 of the California Health and Safety Code and adding Section 43018.5 to the code). AB 1493 required CARB to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR Section 1900, 1961), and adoption of Section 1961.1 (13 CCR Section 1961.1), require automobile manufacturers, beginning with the 2009 model year, to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons). The regulations would reduce GHG emissions from California passenger vehicles by about 22 percent by 2012 and about 30 percent by 2016.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against CARB to prevent enforcement of 13 CCR Sections 1900 and 1961, as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al*. [456 F.Supp.2d 1150, 1172, E.D. Cal. 2006]). The suit in the U.S. District Court for the Eastern District of California contended that California's implementation of regulations that regulate vehicle fuel economy would violate various federal laws, regulations, and policies.

In January 2007, the judge hearing the case accepted a request from the California Attorney General's office that the trial be postponed until a decision is reached by the U.S. Supreme Court on a separate case addressing GHGs. In the U.S. Supreme Court case, *Massachusetts v. U.S. Environmental Protection Agency*, the primary issue in question was whether the FCAA authorizes the EPA to regulate CO_2 emissions. The EPA contended that the FCAA does not authorize regulation of CO_2 emissions, whereas Massachusetts and ten other states, including California, sued the EPA to begin regulating CO_2. As mentioned above, the U.S. Supreme Court ruled on April 2, 2007, that GHGs are "air pollutants" as defined under the FCAA and that the EPA is granted authority to regulate CO_2 (*Massachusetts v. U.S. Environmental Protection Agency* [2007] 549 U.S. 05-1120).

On December 12, 2007, the U.S. District Court for the Eastern District of California rejected the automakers' claim by finding that if California receives appropriate authorization from the EPA (the last remaining factor in enforcing the standard), these regulations would be consistent with and have the force of federal law. This authorization to implement more stringent standards in California was requested in the form of a FCAA Section 209(b) waiver in 2005. Since that time, the EPA has failed to act in granting California authorization to implement the standards. The EPA denied California's request for the waiver to implement AB 1493 in late December 2007. On January 21, 2009, CARB submitted a letter to EPA Administrator Jackson regarding California's request to reconsider the waiver denial. The EPA approved the waiver on June 30, 2009.

EXECUTIVE ORDER S-20-04

Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in state-owned buildings by 20 percent

from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal.

The initiative places the California Energy Commission in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.[29]

EXECUTIVE ORDER S-3-05

Executive Order S-3-05 was established in 2005, in recognition of California's vulnerability to the effects of climate change. Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The executive order directed the secretary of the CalEPA to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of CalEPA created the California Climate Action Team (CAT), made up of members from various state agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through state incentive and regulatory programs.

ASSEMBLY BILL 32 (CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006)

California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

[29] California Energy Commission, *Green Building Initiative, State of California Executive Order S-20-04,* http://www.energy.ca.gov/greenbuilding/, accessed on January 13, 2011.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020.

SENATE BILL 1368

SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas–fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

EXECUTIVE ORDER S-1-07

Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

On April 23, 2009 CARB approved the proposed regulation to implement the LCFS. The LCFS will reduce GHG emissions from the transportation sector in California by about 16 million metric tons (MMT) in 2020. The LCFS is designed to reduce California's dependence on petroleum, create a lasting market for clean transportation technology, and stimulate the production and use of alternative, low-carbon fuels in California. The LCFS is designed to provide a durable framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011. One standard is established for gasoline and the alternative fuels that can replace it. A second similar standard is set for diesel fuel and its replacements.

The standards are "back-loaded"; that is, there are more reductions required in the last five years, than the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the market penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. It is anticipated that compliance with the LCFS will be based on a combination of strategies involving lower carbon fuels and more efficient, advanced-technology vehicles.

SENATE BILL 97

SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR), which is part of the state Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA, by July 1, 2009. The Natural Resources Agency is required to certify and adopt those guidelines by January 1, 2010. SB 97 also removes, both retroactively and prospectively, the legitimacy of litigation alleging inadequate CEQA analysis of effects of GHG emissions in the environmental review of projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E). This provision will be repealed by operation of law on January 1, 2010; at that time, any such projects that remain unapproved will no longer be protected against litigation claims of failure to adequately address climate change issues. In the future, this bill will only protect a handful of public agencies from CEQA challenges on certain types of projects, and only for a few years time.

As set forth more fully below, in June 2008, OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible.[30] OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in Section 15064.7 of the CEQA Guidelines that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state.

On December 30, 2009, the Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010.

[30] Governor's Office of Planning and Research, *CEQA AND CLIMATE CHANGE: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, June 19, 2008.

SENATE BILLS 1078 AND 107 AND EXECUTIVE ORDER S-14-08

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Executive Order S-14-08 was signed, which expands the state's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the state come from renewable energy by 2020. CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

SENATE BILL 375

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects may not be eligible for funding programmed after January 1, 2012.

This law also extends the minimum time period for the regional housing needs allocation cycle from five years to eight years for local governments located within an MPO that meets certain requirements. City or County land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

ASSEMBLY BILL 3018

AB 3018, the California Green Collar Jobs Act of 2008, was signed into law by Governor Schwarzenegger on September 26, 2008. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California's emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.[31]

[31] California Workforce Investment Board, http://www.cwib.ca.gov/special_committees/green_collar_jobs_council, accessed on January 13, 2011.

EXECUTIVE ORDER S-13-08

Executive Order S-13-08, issued by Governor Schwarzenegger, seeks to enhance the state's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.[32]

EXECUTIVE ORDER S-21-09

Executive Order S-21-09, 33 percent Renewable Energy for California, (signed into law by Governor Schwarzenegger on September 15, 2009) directs CARB to adopt regulations to increase California's Renewable Portfolio Standard (RPS) to 33 percent by 2020. This builds upon SB 1078 (2002) which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006) which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.

CARB SCOPING PLAN

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations.[33] CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2eq emissions by 174 MMT, or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO_2eq under a BAU scenario. This is a reduction of 42 MMT CO_2eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

CARB's Scoping Plan also breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory. CARB's Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

[32] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

[33] California Air Resources Board, *Climate Change Scoping Plan, A Framework for Change*, December 2008.

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2eq);
- The LCFS (15.0 MMT CO_2eq);
- Energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems (26.3 MMT CO_2eq); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2eq).

CARB has identified a GHG reduction target of five MMT (of the 174 MMT total) for local land use changes (Table 2 of CARB's Scoping Plan), by Implementation of Reduction Strategy T-3 regarding Regional Transportation-Related GHG Targets. Additional land use reductions may be achieved as SB 375 is implemented. CARB's Scoping Plan states that successful implementation of the plan relies on local governments' land use, planning, and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. CARB's Scoping Plan does not include any direct discussion about GHG emissions generated by construction activity.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

The Southern California Association of Governments (SCAG) is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the Federally designated metropolitan planning organization for the Southern California region and is the largest metropolitan planning organization in the United States. With respect to air quality planning, SCAG has prepared the *Regional Comprehensive Plan: Helping Communities Achieve a Sustainable Future* for the region, which focuses on transportation and growth management and forms the basis for the land use and transportation control portions of the *2007 Air Quality Management Plan for the South Coast Air Basin*. SCAG is responsible under the Federal Clean Air Act for determining conformity of projects, plans, and programs with the South Coast Air Quality Management District (SCAQMD).

Local

The City of Murrieta has implemented a number of policies and programs to assist the community in preserving the local environment. Existing programs and policies relevant to community GHG emissions reductions include the following:

- **Water Efficient Landscaping Ordinance.** Section 16.27 of the City's Municipal Code, the Water Efficient Landscaping Ordinance, is intended to promote water efficient landscaping, water use management, and water conservation through the use of water efficient landscaping, wise use of turf areas, and appropriate use of irrigation technology

and management; reduce water demands while maintaining landscape quality and quantity; eliminate waste; encourage creative design; and raising public awareness.

- **Alternative Energy Generation – Non-Commercial Wind Energy Conversion Systems (N- WECS).** Conditional Use Permits allow non-commercial wind energy conversion systems N-WECS (also known as windmills) within the City of Murrieta on rural residential lots, pursuant to the standards in Section 16.44.220 of the Municipal Code. The systems allowed include small wind energy systems that are rated to produce no more than 100 kilowatts (kW) and will be used primarily to reduce on-site consumption of power provided by the utility companies. For sites with both N-WEC Systems and connections to power provided by the utility company, excess electrical power generated by the N-WECS and not presently needed for on-site demand, may be used by the utility company in exchange for a reduction in the cost of electrical power provided by that company to that site, as long as no net revenue is produced by the excess power.

- **Solar Panels.** The following describes Municipal Code standards and regulations pertaining to solar panels:

  - Municipal Code Section 16.08.040(C)(3)(d), Multi-Family Residential Design Standard states that solar panels shall be integrated into the roof design, flush with the roof slope. Frames shall be colored to match roof colors. Any support equipment shall be enclosed and screened from view.

  - Section 16.10.030(A)(5)(a) of the Municipal Code states that solar collectors, along with other utility and mechanical equipment, must be concealed from view in compliance with Section 16.18.120(B) (Screening and Buffering).

  - Free-standing solar devices placed directly upon the finish grade and do not exceed a height of 18 inches above the surrounding finish grade at any point are exempt from the minimum setback requirements (Section 16.18.140(B)(2) of the Murrieta Municipal Code).

  - Section 16.18.140 (D)(2) states that solar devices may extend into front, back, and side yard setbacks as long as they do not increase the floor area enclosed by the structure.

  - Section 16.18.140 (D)(4)(a)(2) of the Murrieta Municipal Code states that freestanding solar devices that are placed directly upon the finish grade, and which equal or exceed a height of 18 inches above the surrounding finish grade at any point, shall conform to the setback requirements identified in Article II (Zoning Districts, Allowable Land Uses) for detached accessory structures.

  - 16.28.080(B)(7). Trees and shrubs shall be planted and maintained in a manner that protects the basic rights of adjacent property owners, particularly the right to solar access.

- **Condominium Standards for Energy Conservation.** Municipal Code Section 16.44.080(D)(2)(D)(2) states that the project should include energy and resource conservation measures, including high efficiency thermal insulation, high efficiency heating and cooling equipment, double glazing, water flow restrictors, solar water heating and other similar conservation techniques.

- **Solar Access Easements.** Municipal Code Section 16.106.030(H) states that the subdivider, as a condition of approval of a tentative map, may be required to dedicate easements for the purpose of ensuring that each parcel or unit in the subdivision may have the right to receive sunlight across adjacent parcels or units in the subdivision for any solar energy system, as defined by state law (Civil Code Section 801.5), in compliance with state law (Government Code Section 66475.3). At the time of tentative map approval; the commission may impose conditions which specify the following standards for determining the exact dimensions and locations of the easements; restrictions on structures, vegetation, and other objects which would obstruct the passage of sunlight through the easement; and terms or conditions under which an easement may be revised or terminated.

- **Household and Green Waste.** The City has contracted Waste Management to collect household and green waste. The City offers information on additional waste disposal locations and hazardous waste drop offs.

- **Recycling.** In response to various environmental concerns and the State of California Waste Management Act (AB 939), the City is committed to reduce the amount of waste sent to the landfills. The City also offers a wealth of information on locations for recycling materials, green waste, and construction/demolition debris.

- **Green Schools Leadership Award.** The Murrieta Valley Unified School District (MVUSD) was presented a Green Schools Leadership Award on December 9, 2010, by the Green California Schools Summit. The award was presented to the MVUSD for its "far-reaching sustainability programs and projects." Since 2007, MVUSD has saved nearly $900,000 by reducing energy costs due to their development of the Alliance to Save Energy's Green School Program. The two-year program created student "green teams" that continue to audit energy use and look for ways to use less energy on school campuses. MVUSD is also in the middle of a lighting retrofit program that could save up to $250,000 more per year, including 36,000 light bulb replacements through a Southern California Edison program, and about $1.2 million worth of materials are being installed at no cost to the district.[34]

- **ICLEI Membership.** The City of Murrieta is a committed member of the International Council for Local Environmental Initiatives – Local Governments for Sustainability (ICLEI). ICLEI has been a leader both internationally and domestically for more than ten years, representing over 770 local governments around the world. ICLEI was launched

[34] The Press Enterprise – Murrieta –Menifee Local News, *Murrieta: Schools' energy savings lauded*, December 4, 2010, http://www.pe.com/localnews/murrieta/stories/PE_News_Local_D_sgreen05.24bdacc.html.

in the United States in 1995 and has grown to more than 230 cities and counties providing national leadership on climate protection and sustainable development. In June 2006, ICLEI launched the California Local Government Climate Task Force as a formal mechanism to provide ongoing input and collaboration into the State of California's climate action process.

MURRIETA'S GHG EMISSIONS AND REDUCTION TARGET

Baseline and Projections

In 2009, the City of Murrieta generated 430,842 metric tons of carbon dioxide equivalents ($MTCO_2eq$). Transportation-related activities account for the majority of the City's GHG emissions (approximately 48.3 percent). Approximately 23.5 percent of Murrieta's community-wide GHG emissions are attributed to residential uses. Commercial uses account for approximately 15.4 percent. Office, business park, civic/institutional, industrial, and waste disposal account for the remaining 12.6 percent of community-wide GHG emissions. In the short term, transportation emissions are expected to decrease because of lower emissions from newer vehicles. These decreased emissions would likely outweigh expected increases in VMT. However, in the long term, projected increases in VMT outweigh decreased vehicle emissions resulting from improved fuel efficiency. Thus, the City's GHG emissions would be expected to increase to approximately 833,934 $MTCO_2eq$ in 2020, and continue to increase throughout proposed General Plan Update buildout (2035). Additional information regarding the City's baseline and projected GHG emissions is provided in Chapter 2, *Emissions Inventory*.

IMPLEMENTATION

To meet its GHG emission reduction targets, the City needs to prioritize actions, mobilize residents, business owners, and staff, and work with neighboring jurisdictions and regional agencies to create feasible solutions. Additional information regarding the City's baseline and projected GHG emissions is provided in Chapter 4, *Implementation*.

APPROACH

Applying CAP measures to obtain tangible results requires concrete action steps and the flexibility to change as economic, political, and environmental conditions demand. Chapter 4 outlines the specific action steps that will implement each measure for which GHG emission reductions have been quantified. The City has provided an implementation timeframe and responsible departments for each action step. Additionally, the City has selected performance indicators and monitoring and reporting requirements that will be used to evaluate the success of each measure.

The City's Community Development Department will oversee the tracking and reporting of progress toward achieving the City's GHG emission reduction target of 15 percent below 2009 levels by 2020. The City Council will be provided annual reports to the on the progress made toward achieving the reduction target as a whole, and for each quantified measure. If the

measures do not achieve or surpass the expected GHG reductions, the City will examine ways to increase measure performance or create new measures capable to compensate for missed emission reductions.

PLAN ADJUSTMENTS AND FLEXIBILITY

The CAP represents the City's aggressive effort to respond to the challenge of climate change at the time of preparation. The topic of climate action planning is changing frequently and rapidly evolving. Over the next decade, new information, GHG reduction methods, and legislation are likely to develop. In order to remain effective, the CAP must evolve over time. Therefore, the CAP will be reviewed and modified on a regular basis to identify potential plan update needs. These reviews will evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy.

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Chapter 2

Emissions Inventory

Chapter 2
Emissions Inventory

This section describes Murrieta's greenhouse gas (GHG) emissions inventory. The baseline emissions inventory is based on California Air Resources Board (CARB) and ICLEI—Local Governments for Sustainability (ICLEI) protocols and provides emissions for both community-wide and municipal sources for Year 2009. It should be noted that the comprehensive General Plan Update uses 2009 as the year for the environmental conditions baseline.

The inventory was compiled using ICLEI's Clean Air Climate Protection (CACP) software. The emissions sources represent the total GHG emissions occurring within the City and include the major such as including residential, commercial, and industrial buildings; transportation; water conveyance; solid waste; and municipal operations. The GHG emissions from these sectors are associated with numerous direct and indirect sources. Direct sources are attributed to combustion of fossil fuels and area source emissions from buildings. Indirect sources consist of emissions from electricity generation, solid waste, and water transport.

Once completed, these inventories provide the basis for creating an emissions forecast and reduction target, and enable the quantification of emissions reductions associated with implemented and proposed measures.

METHODOLOGY

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. Community emissions from electricity and natural gas are based on usage rates specific to each land use type and are calculated using emissions coefficients compiled by ICLEI. Transportation data, including vehicle miles traveled (VMT), are based on traffic data provided by Iteris, whom conducted the traffic analysis for the General Plan Update. Solid waste data was based on generation factors as well as historic and projected generation data identified in the City of *Murrieta General Plan Update Program EIR* and the *California Department of Resources Recycling and Recovery (CalRecycle)*. City staff were instrumental in providing data on municipal operations.

Compiled data were entered into the CACP software to create a community emissions inventory and a municipal emissions inventory. The community inventory represents all the energy used and waste produced within Murrieta and its contribution to GHG emissions. Municipal sources represent all City operated buildings and vehicles, and include government buildings, solid waste, and street lights. The municipal inventory is a subset of the community inventory, and includes emissions derived from internal government operations.

Separate emissions inventories for community and municipal operations are generally created since the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Additionally, by proactively reducing emissions generated by its own activities, the City of Murrieta takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in Murrieta, as well as for inspiring other communities.

When calculating the emissions inventory, all energy consumed in the City was included. As a result, even though the electricity used by Murrieta's residents is produced elsewhere, this energy and emissions associated with it appears in the City's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community. Additionally, the energy consumption is a result of activities that are within the City's regulatory authority.

CACP Software

The CACP software estimates emissions derived from energy consumption and waste generation within a community. Emissions are determined using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of carbon dioxide equivalent units (CO_2eq)[1]. Converting all emissions to CO_2eq units allows for the consideration of different GHGs in comparable terms. For example, methane is 21 times more powerful than CO_2 in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO_2eq.

The emission coefficients and methodology employed by the software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National GHG Emissions Inventories), the U.S. Voluntary GHG Reporting Guidelines (EIA form1605), and, for emissions generated from solid waste, the U.S. EPA's Waste Reduction Model (WARM).

GHG EMISSIONS SECTORS

CACP separates the GHG emissions inventory into community-wide and government-related emissions. Community-wide emissions represent the total GHG emissions originating from activity within each sector throughout the community. Government-related emissions, although separated in CACP, are considered a subset of the community-wide (i.e., total) GHG emissions. CACP calculates GHG emissions from energy consumption, transportation, and solid waste, which are further discussed below.

[1] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

Energy Consumption

Energy related emissions are from the consumption of both electricity and natural gas. These emissions are both direct (e.g., building energy consumption) and indirect (e.g., produced off-site from energy production and water consumption [including water treatment and delivery]). The emissions inventory used electricity and natural gas usage rates for residential, commercial, and industrial land uses for the year 2009 from the California Energy Commission (CEC) California Grid Average. The energy consumption data separated private users from government-operated facilities (i.e., City owned).

In order to calculate GHG emissions from natural gas and electricity consumption, ICLEI obtained California-specific emission coefficients. For natural gas consumption, a 2009 emission coefficient (kilograms of CO_2 per million British thermal units [kg CO_2/MMBtu]) for natural gas delivery was used within CACP for both community-wide and government-related energy use. The specific natural gas emission coefficient used to calculate GHG emissions was verified by California Climate Action Registry (CCAR) and the CEC. Similar to natural gas consumption, a 2009 emission coefficient (pounds of CO_2 per kilowatt [lbs CO_2/kWh]) was used to calculate GHG emissions associated with electricity delivery, which is also verified by CCAR.

Transportation

Murrieta's transportation sector includes emissions generated from VMT. Iteris provided vehicle activity data (i.e., VMT) occurring on local roadways and freeway ramps within the City limits. The City provided vehicle and VMT data for the government (i.e., City) vehicle fleet.

ICLEI used CARB's Emission Factors model (EMFAC2007) to obtain Riverside County-specific emission coefficients for vehicle fuel distribution, vehicle fuel efficiencies, and emission factors. Riverside County-specific emissions factors data was only used for community-wide transportation data. The City provided municipal vehicle fleet data with specific information regarding fuel and vehicle types. ICLEI also used EMFAC2007 assumptions to generate emission factors for the City vehicle fleet.

Solid Waste

Emissions from waste result primarily from organic waste occurring at landfills where the waste is disposed. Methane (CH_4) is the primary GHG from waste and the emissions result from chemical reactions and microbes acting upon the waste as the biodegradable materials break down. Solid waste generation and disposal data was obtained from CalRecycle (formerly the California Integrated Waste Management Board [CIWMB]). CACP provides GHG emission coefficients for various solid waste categories. These national default emission coefficients were used to calculate GHG emissions associated with solid waste disposal. The only alteration made to these emission coefficients was to set all waste category sequestration rates to zero in order to avoid the City taking credit for downstream emissions sequestration without also accounting for upstream emissions associated with production, transport, and consumption.

BASELINE GHG EMISSIONS INVENTORY

Community Sector

Table 2-1, *Baseline (Year 2009) Community-Wide GHG Emissions Inventory*, presents Murrieta's 2009 community-wide GHG emissions and the percent contribution of each emissions sector. As shown below, transportation-related activities account for the majority of the City's GHG emissions (approximately 48.3 percent). Approximately 23.5 percent of Murrieta's community-wide GHG emissions are attributed to residential uses. Commercial uses account for approximately 15.4 percent. Office, business park, civic/institutional, industrial, and waste disposal account for the remaining 12.6 percent of community-wide GHG emissions.

Table 2-1
Baseline (Year 2009) Community-Wide GHG Emissions Inventory

Community Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Residential	91,492	23.5
Commercial		
Commercial	60,153	15.4
Office	12,711	3.3
Business Park	8,332	2.1
Civic/Institutional	9,333	2.4
Industrial	3,463	0.9
Transportation	188,138	48.3
Waste	14,795	3.8
TOTAL[1]	**389,717**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

Municipal Sector

Municipal emissions include energy use from City facilities such as water delivery facilities as well as government buildings, vehicle fleets, streetlights, and City employee commuting. Municipal sector emissions represent an opportunity for the City to demonstrate how to reduce GHG emissions. Table 2-2, *Baseline (Year 2009) Municipal Operations GHG Emissions Inventory*, presents government-related GHG emissions and the percent contribution of each emission sector. Approximately 58.2 percent of government-related GHG emissions are generated from water pumping, treatment, and delivery and wastewater treatment accounts for 14.8 percent. Electricity consumption of streetlights and traffic signals represent 18.6 percent.

GHG emissions from employee commute total approximately 4.2 percent of government-related emissions, while buildings and facilities account for just 1.1 percent of annual GHG emissions.

Table 2-2
Baseline (Year 2009) Municipal Operations GHG Emissions Inventory

Municipal Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Buildings and Facilities	466	1.1
Streetlights & Traffic Signals	7,640	18.6
Water Delivery Facilities	23,941	58.2
Wastewater Facilities	6,091	14.8
Employee Commute	1,738	4.2
Vehicle Fleet	1,251	3.0
Total[1]	**41,125**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

Total Baseline GHG Emissions

Total Baseline GHG emissions include both the Community Sector and the Municipal Sector. As indicated in *Table 2-3*, *Total Baseline (Year 2009) GHG Emissions*, the Citywide GHG emissions are 430,842 metric tons (MT) CO_2eq per year. On a per capita basis, the annual emissions for each person in the City is 4.3 $MTCO_2eq$.

Table 2-3
Total Baseline (Year 2009) GHG Emissions

Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Community Sector	389,717	90.5
Municipal Sector	41,125	9.5
Total	**430,842**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

PROJECTED EMISSIONS

To determine the GHG emission reductions necessary to achieve Murrieta's target (15 percent reduction in emissions from 2009 emission levels by 2020), the City's GHG emissions were projected for the General Plan Update buildout year of 2035, then GHG emissions were projected for year 2020 under a trend scenario. The trend scenario is based on future growth and development anticipated in the General Plan Update as well as future year consumption rates for energy, transportation, water transport, and waste. The existing and projected emissions are presented in Table 2-4, *Baseline and Projected 2020 and 2035 Emissions*. The emissions forecast estimates future emissions under a Business As Usual (BAU) scenario. The BAU scenario assumes that no effort has been made to reduce emissions. Therefore, the future emissions depicted in Table 2-4 present how GHG emissions may increase in Murrieta if no reduction programs are implemented.

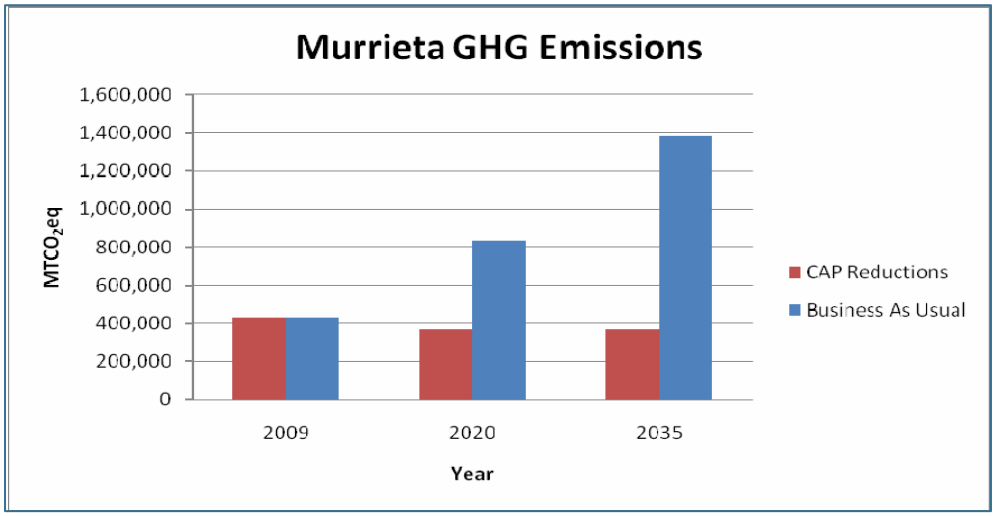
Table 2-4
Baseline and Projected 2020 and 2035 Emissions

Emissions Sector	GHG Emissions					
	2009 Baseline		2020 Projected		2035 Projected	
	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]
COMMUNITY SECTOR						
Residential	91,492	23.5	105,148	13.3	123,770	9.3
Commercial						
Commercial	60,153	15.4	96,636	12.3	146,386	11.0
Office	12,711	3.3	232,750	29.5	532,806	39.9
Business Park	8,332	2.1	23,398	3.0	43,942	3.3
Civic/Institutional	9,333	2.4	8,309	1.1	6,914	0.5
Mixed Use	-	-	3,113	0.4	7,358	0.6
Industrial	3,463	0.9	4,241	0.5	5,302	0.4
Transportation	188,138	48.3	296,651	37.6	444,625	33.3
Waste	14,795	3.8	18,419	2.3	23,363	1.8
Community Sub-Total[2]	**389,717**	**100**	**788,666**	**100**	**1,334,466**	**100**
MUNICIPAL SECTOR						
Buildings and Facilities	466	1.1	485	1.1	513	1.0
Streetlights & Traffic Signals	7,640	18.6	8,125	17.9	8,786	17.3
Water Delivery Facilities	23,941	58.2	26,791	59.2	30,679	60.3
Wastewater Facilities	6,091	14.8	6,864	15.2	7,918	15.6
Employee Commute	1,738	4.2	1,739	3.8	1,740	3.4
Vehicle Fleet	1,251	3.0	1,264	2.8	1,281	2.5
Municipal Sub-Total[2]	**41,125**	**100**	**45,268**	**100**	**50,917**	**100**
Grand Total (Community and Municipal Sectors) [2]	**430,842**	N/A	**833,934**	N/A	**1,385,382**	N/A

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. The percentage of emissions refers to the respective sectors (either community or municipal) and not to the combined total.
2. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.



Growth and development under a 2035 BAU scenario would continue along a similar trend as under the 2020 BAU conditions. Assuming that the same type of current emissions-generating practices continue to occur within Murrieta, the City's GHG emissions would be anticipated to increase from 430,842 $MTCO_2eq$ in 2009 to 1,385,382 $MTCO_2eq$ in 2035. This represents a 192 percent increase from the 2009 baseline level in 2035. In comparison, the City's projected population is expected to increase 32 percent by 2035 from 2009.[2] Therefore, if current emissions-generating practices continue, Murrieta's GHG emissions are expected to increase at a higher rate than its population in 2035. This trend can be explained by increases in per capita activity levels (i.e., energy consumption, waste disposal, water consumption, and VMT).

Under a BAU scenario, the City's GHG emissions (municipal and community) would be anticipated to increase from 430,842 $MTCO_2eq$ in 2009 to 833,934 $MTCO_2eq$ in 2020. This represents a 75 percent increase from the 2009 baseline level. In comparison, the City's projected population is expected to increase 13 percent by 2020 from 2009.[3] Therefore, if current emissions-generating practices continue, Murrieta's GHG emissions are expected to increase at a higher rate than its population in 2020. This trend can be explained by increases in per capita activity levels (i.e., energy consumption, waste disposal, water consumption, and VMT).

GHG REDUCTION TARGET

The City of Murrieta recognizes the importance of reducing GHG emissions. Clearly defined emissions reduction targets will provide City decision makers and the community with a clear

[2] Southern California Association of Governments (SCAG), *Adopted 2008 RTP Growth Forecast by City*, http://www.scag.ca.gov/forecast/index.htm. Accessed January 17, 2010.

[3] Ibid.

direction for Murrieta's GHG emissions management efforts, and will provide milestones against which progress can be evaluated over time. This quantitative target coupled with strategies and actions in this CAP the will allow Murrieta to have greater control of the amount of GHGs emitted into the atmosphere.

Under AB 32, the State has committed to reducing GHG emissions to 1990 levels by 2020. Based on the CARB *Scoping Plan*, reducing GHG emissions to 1990 levels means cutting approximately 30 percent from BAU emission levels projected for 2020, or about 15 percent from today's levels.[4] The CARB *Scoping Plan* projects future emissions by comparing potential reductions from various measures to a BAU scenario. The BAU scenario represents future GHG emissions without the implementation of reduction measures. As a result, the CARB *Scoping Plan* outlines the State's strategy to achieve the 2020 GHG emissions limit with a comprehensive set of actions that will be developed by 2012.

Consistent with the CARB Scoping Plan, the City of Murrieta has chosen a reduction target of 15 percent below their current (2009 baseline) emissions levels by 2020. This reduction trend would continue through the General Plan buildout year of 2035. The 15 percent below current emissions reduction target will contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals. To attain the adopted target, Murrieta will need to reduce Citywide GHG emissions by 468,469 $MTCO_2eq$ by 2020; refer to Table 2-5, *GHG Emissions Summary and Reduction Target*. This represents a 56 percent reduction from projected 2020 GHG emissions levels which take into account population growth and BAU emissions generation.

Table 2-5
GHG Emissions Summary and Reduction Target

Scenario[1]	GHG Emissions (MT CO_2eq/yr)
Total 2009 Baseline GHG Emissions	430,842
Total 2020 BAU projected GHG Emissions	833,934
Total 2035 General Plan Buildout projected GHG Emissions	1,385,382
Emissions Reduction Target (15 percent below 2009 emissions)	366,218
2020 GHG Emissions Reductions from BAU	468,469

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year; BAU = Business As Usual

Notes:
1. All scenarios refer to both community-wide and municipal emissions as the "total" amount of GHG emissions.

To achieve these emissions reductions, the City will implement reduction strategies for each category of GHG emissions (e.g., transportation, energy and water consumption, and waste disposal). Chapter 3 identifies GHG reduction measures capable of achieving this target, and describes the relationship of the City's local actions to statewide efforts to curb GHG emissions.

[4] In the CARB Scoping Plan, "today's levels" are based on the statewide GHG inventory for 2005. However, cities and counties are encouraged to set a 15 percent GHG reduction target for both municipal operations and the community as a whole based on the most current GHG inventory conducted.

Chapter 3

Climate Actions Strategies

Chapter 3
Climate Actions Strategies

Assembly Bill 32, the Global Warming Solutions Act of 2006, requires a reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020. The California Air Resources Board (CARB) is the lead agency for implementing AB 32, which set the major milestones for establishing the program. CARB met the first milestones in 2007: developing a list of discrete early actions to begin reducing GHG emissions, assembling an inventory of historic emissions, establishing GHG reporting requirements, and setting the 2020 emissions limit. As part of its mandate, CARB developed a Scoping Plan which outlined the State's strategy to achieve the 2020 GHG emissions limit. This Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. This "Approved Scoping Plan" was adopted by CARB at its December 11, 2008 meeting. In setting the reduction goal, the Scoping Plan identifies that reducing GHG emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emission levels projected for 2020, or about 15 percent from today's levels. In response, the City of Murrieta has established a goal to reduce community-wide GHG emissions to 15 percent below baseline levels by 2020. It should be noted that the comprehensive General Plan Update uses 2009 as the year for the environmental conditions baseline.

This chapter describes the seven strategies that Murrieta has crafted to achieve this target. Combined, these strategies will decrease GHG emissions by approximately 469,386 metric tons of carbon dioxide equivalent ($MTCO_2eq$) by 2020, enabling the community to contribute to global efforts to combat climate change. It should be noted that the strategies and emissions reductions measures take into account projected growth within the City. Each of the strategies contains emission reduction measures from municipal and non-municipal operations. These measures are consistent with and build upon the Goals and Policies within the City's General Plan Update. Although this section includes GHG inventories for Year 2035 (Buildout year associated with the general Plan Update), these are included only for informational purposes, as the reduction strategy that was chosen is set to comply with the AB 32 benchmark of Year 2020. However, implementation of the GHG reduction measures in the CAP would ensure the GHG emissions are significantly reduced from a Year 2035 business as usual scenario.

The measures were developed from evaluating the General Plan Update Existing Conditions Report, identifying emission reduction opportunities – especially those embraced by the community realized through community outreach, reviewing best practices from other jurisdictions and organizations, and incorporating State and regional laws, guidelines, and recommendations. The selected measures were recommended on the following criteria:

- Is it technically possible to implement the measure and would the community support it?

- Does this measure create additional co-benefits (i.e., quality of life, public health, jobs/housing balance)?

The seven emission reduction strategies are as follows:

- **Community Involvement Strategy.** The community involvement strategy is intended to foster a sense of ownership of the ideas and actions to be carried out within the City. To create a successful plan that is supported by the community, who will ultimately make these changes.

- **Land Use and Community Vision Strategy.** The land use and community vision strategy encourages changes in the land use pattern to enable residents to reduce dependence on their cars to get around town.

- **Transportation and Mobility Strategy.** The transportation and mobility strategy identifies opportunities to improve mobility such as walking, bicycling, and transit use, and to decrease the need to drive.

- **Energy Use and Conservation Strategy.** The energy use and efficiency strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.

- **Water Use and Efficiency Strategy.** The intent of this strategy is to conserve water through efficient use and conservation.

- **Waste Reduction and Recycling Strategy.** The strategy builds on past City successes by increasing waste diversion, reducing consumption of materials that otherwise end up in landfills, and increasing recycling.

- **Open Space Strategy.** This strategy expands the utilization of open spaces for habitat, storm water management, soil retention, air filtration, and cooling, aesthetic and economic value, local food security, increased and improved parks, preservation, and to create new open spaces.

Each strategy recommends measures and actions that will make the vision of the CAP a reality. Measures define the direction that the City will take to accomplish its GHG reduction goals. Actions define the specific steps that City staff and decision-makers will take over time.

SECTION STRUCTURE

This section is organized by strategy, measures, and actions. Each of the seven strategies represents the primary ways to reduce GHG emissions in Murrieta. Each strategy begins with an introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. This introduction is then followed by the component measures and actions that translate to the City's vision to implementation. The following identifies the major component of each GHG reduction measure:

- **GHG Reduction Measures.** Measures define the programs, policies, and projects that the City will undertake to accomplish its GHG reduction targets.

  - ***Measure Description.*** Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide detailed guidance that will be used in program implementation.

  - ***Action and Performance Criteria.*** Detailed action steps and performance criteria are provided in a table following each measure description. Actions identify specific steps that the City will take to implement the measure. The table also identifies the responsible departments and establishes an implementation schedule for each action.

  - ***GHG Reduction Potential.*** GHG reduction potential for each measure was calculated based on research data, findings, and guidance from public agencies, associations, and research institutes such as the Center for Clean Air Policy (CCAP), the Victoria Transport Institute (VTI), and the California Air Pollution Control Officers Association (CAPCOA). In several instances, combining measures lead to better emissions reductions than implementing a single measure by itself. These measures have been identified as "supporting measures." Supporting measures do not necessarily have a quantifiable GHG reduction potential of their own, but facilitate reductions of other associated measures. Therefore, measures that contribute to the reductions of other measures have been identified as supporting measures.

Table 3-1, *City Departments Responsible for Implementing the CAP*, indicates the various City departments and divisions that will be responsible for implementing the CAP. Performance criteria and targets provided with each measure, enable staff, the City Council, and the public to track implementation and monitor overall CAP progress.

RESPONSIBILITY

The City's Community Development Department will oversee the implementation and monitoring of the GHG reduction strategies. Through this process, additional City Departments (i.e., Public Works, Building and Safety, Engineering, Maintenance, etc.) would be engaged to ensure the goal and reduction measures are achieved to realize the City's reduction target.

1. COMMUNITY INVOLVEMENT STRATEGY

Community involvement, public education, and effective participation are key to successful implementation of the CAP. During the CAP implementation period, the City will conduct outreach programs that involve residents and businesses in GHG-reducing activities, assessments, and actions. Effective public participation will increase the likelihood that the GHG reduction measures recommended in this plan achieve estimated participation rates. The outreach and education programs should be adapted over time to meet the changing needs of the community. Residents of all ages should have access to public education on these programs. Educating both children and their parents will reinforce the message. Education programs can include workshops, seminars, consultations, presentations, brochures, and flyers. Specific measures related to municipal operations are described in this section.

Increase Public Education

Goal CIR-6 Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.

Measure Description: According to the 2000 US Census, 79 percent of residents drove alone to work, 12 percent carpooled, and seven percent traveled by other means or worked from home.[1] Automobiles are the most widely utilized mode of transportation amongst residents of Murrieta. For most residents, driving is the quickest and most convenient way to get around or out of town. Murrieta is looking to expand alternative modes of transportation with the City, such as bicycle and bus systems. Participation in utilizing alternative modes of transportation would increase with outreach workshops and presentations. Through the increased use of bus services and bicycle infrastructure, GHG emissions would be reduced through the reduction of vehicle miles traveled.

[1] U.S. Census Bureau, *Census 2000 Summary File 3* (SF 3) Sample Data, Table P35 Private Vehicle Occupancy for Workers 16 Years and Over, July 2007.

Number	Measure
CIR-6.12	Increase public education about public transit options.
Action	**Target/Performance Criteria**
Provide public workshops/presentations about public transportation options.	At least one workshop per quarter.
GHG Reduction Potential	Supporting Measure

Green the City Operations

Goal CSV-15 A community taking a leadership role in resource conservation and reduction of greenhouse gas emissions by implementing programs to improve municipal operations.

Measure Description: The City of Murrieta has an opportunity to serve as an example for the community by taking a leadership role in greening municipal operations by transitioning to more energy-efficient buildings and operations.

In order to begin making City operations more efficient, energy audits will be conducted by the City to identify areas where the highest consumption of natural resources occurs. The City can continue to implement and develop new waste reduction programs at municipal facilities. To conserve water, the City can retrofit and/or install water- and energy-efficient fixtures and appliances in all municipal facilities as well as use recycled water where appropriate and feasible in City parks and landscaped areas. The City can demonstrate cutting-edge green building techniques when constructing and retrofitting municipal buildings. To conserve energy, the City can use energy-efficient lighting in parks, streets, and other public places as well as considering renewable energy generation systems on City-owned property. Over time, this information can facilitate more efficient use of energy and water in municipal operations.

Number	Measure
CSV-15.1	Consider renewable energy generation systems on City-owned property for use in municipal operations.
CSV-15.2	Reduce fuel consumption and emissions from municipal fleet vehicles.
CSV-15.3	Continue to implement waste reduction programs at municipal facilities.
CSV-15.4	Consider retrofitting and/or installing water- and energy-efficient fixtures and appliances in all municipal facilities, where appropriate and feasible.
CSV-15.5	Encourage the use of recycled water where appropriate and feasible in City parks and landscaped areas, and demonstrate preferred techniques for water-efficient landscaping, including the use of native plants.
CSV-15.6	Demonstrate cutting-edge green building techniques when constructing and retrofitting municipal buildings.
CSV-15.7	Use energy-efficient lighting in parks, streets and other public places.

Action	Target/Performance Criteria
Percentage of energy efficiency improvement through retrofits and conservation measures.	20 percent improvement by 2020 40 percent improvement by 2035
GHG Reduction Potential	97 $MTCO_2eq$

Green the City Fleet

Goal HC-1 Application of innovative and model best practices in the community health field.

Measure Description: This is a supporting measure for Greening the City Operations measure to 'reduce fuel consumption and emissions from municipal fleet vehicles'. The integration of these fuel-efficient and low-emissions vehicle will set an example to residents and businesses within the City that Murrieta is serious about reducing GHGs.

Number	Measure
HC-1.3	Encourage that the municipal vehicle fleet achieve the highest possible number of fuel-efficient and low emissions vehicles commercially available.

Action	Target/Performance Criteria
Incorporate hybrid and/or electric vehicles into the City fleet.	20 percent alternative fuel vehicles by 2020 50 percent alternative fuel vehicles by 2035
GHG Reduction Potential	253 $MTCO_2eq$

2. LAND USE AND COMMUNITY VISION STRATEGY

As a community with vacant lots and development potential, the land use strategy focuses on improving existing areas and increasing the density of new mixed use developments to shape walkable areas throughout the community. A series of community workshops were conducted by the City for the General Plan update. Through this visioning process, community priorities were identified such as 'preserving the elements of Murrieta's rural heritage' and 'protecting and fostering a strong sense of community and safety, as well as the "home town" feeling'. The community envisions a network of bicycle paths they can use to get around town without a car.

Land use patterns and urban design can impact climate change by the type of lifestyle the people who dwell there can enjoy. In areas of low density, such as suburban development, travel patterns are auto-oriented, meaning that it is most convenient to drive everywhere, and walking, biking, or transit may take longer to reach your destination. Auto-oriented development is comprised of wide streets, long stretches of sidewalks, dominant garages, and great distances between homes and jobs, schools, and retail. Vehicle miles traveled and vehicle trips are reduced when jobs, schools, and retail are closer to home. According to the U.S. Census Bureau, in 2008 approximately 21 percent of individuals employed within the City of Murrieta also lived in the City. In high density areas, residents can easily walk, bicycle, or ride public transit to the places they need to go and their lives depend less on the automobile.

The GHG inventory accounts for specific land-use related emissions, and considers the effects of land use comprehensively within the transportation sector. Where people live determines how far they will travel to work, shop, and other destinations. It also influences whether they will choose to walk, bike, use public transit, or drive. If residents live near bus stops, neighborhood-serving commercial centers, or their work places, they are more likely to use alternative lower-emission travel modes than to drive.

Balance of Land Uses to Reduce Vehicle Miles Traveled

Goal LU-1 **A complementary balance of land uses throughout the community that meets the needs of existing residents and businesses as well as anticipated growth, and achieves the community's vision.**

Measure Description: How far we travel to work, shop, and recreate depends on the urban/suburban environment. When all of the things we need are close to home and within the City, it reduces the distance to travel, therefore, reducing vehicle miles traveled. The community envisions an abundance of parks and facilities for recreational activities; cultural amenities; improved health care; and excellent school, police, fire, library, and recreation services. A built environment that caters to mobility through multiple modes of transportation such as walking and biking reduces dependency on cars. With services and recreational facilities within a 0.5 mile walk from home, residents are more able to leave their cars at home and their quality of life is enhanced.

Number	Measure
LU-1.6	Promote future patterns of development and land use that reduce infrastructure construction costs and make better use of existing and planned public facilities.
Action	**Target/Performance Criteria**
Amend the City's Development Code to include design standards that: • Space development areas a minimum of ¼ to ½ mile apart so that 2- and 4-lane roads can be used and the reliance on large arterials can be reduced. • Have internal connectivity such that there are at least 200 intersections per square mile. • Requires adequate pedestrian access through all commercial, residential, and mixed-used development. • Includes a pedestrian or bicycle through-connection in any new cul-de-sacs, except where prohibited by topographical conditions. • Establish a 0.5-mile walkability standard for residents to access services and recreational facilities.	Incorporate the design standards into the Development Code by 2013.
GHG Reduction Potential	18,674 $MTCO_2eq$

Improve Jobs/Housing Balance

Goal LU-4 A housing stock that meets the diverse needs of Murrieta's existing and future residents.

Measure Description: Currently the City of Murrieta has more housing than jobs which causes residents to commute to work outside of the City. The City would benefit greatly from attracting quality development that provides local employment opportunities. With more local employment opportunities, the City would be able to provide a greater variety of services to its residents, further reducing vehicle miles traveled and capturing sales tax revenues.

Number	Measure
LU-4.3	Locate multiple-family housing adjacent to jobs, retail, schools, open space, public transportation, and transportation corridors.
Action	**Target/Performance Criteria**
Ensure new development is located as close to existing development as possible and maximize the density and mix of uses.	Ongoing.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal LU-5 Promotion of quality industrial development that provides local employment opportunities.

Measure Description: The jobs/housing balance in Murrieta would be further balanced by ensuring that new multi-family housing developments are located near jobs, retail, schools, open space, and transportation. This increase in density would enable residents to enjoy alternative modes of transportation.

Number	Measure
LU-5.1	Support redevelopment and transition of obsolete industrial and manufacturing sites for commercial, flex-tech, and/or mixed-use development, reflective of current market demand.
LU-5.2	Promote quality design and development practices that reduce environmental impacts.
Action	**Target/Performance Criteria**
Create a redevelopment plan that identifies potential sites for redevelopment.	Complete redevelopment plan by 2014.
Update the City's Development Code to incorporate quality design and development practices.	Update Development Code by 2013.
GHG Reduction Potential	3,641 $MTCO_2eq$

Improve Jobs/Housing Balance

Goal LU-6 Land use policy that encourages job retention and attraction.

Measure Description: Being flexible in land use regulations would enable the City to adapt to emerging businesses and industry, especially with the changing economy. A city must adapt to changing economies to be able to keep a healthy workforce and remain sustainable.

Number	Measure
LU-6.1	Encourage flexibility in land use regulations to respond to requirements of new and emerging business and industry types.
Action	**Target/Performance Criteria**
Update the Development Code to allow for emerging business and industry types.	Update Development Code by 2013.
GHG Reduction Potential	52,288 $MTCO_2eq$

Transit Oriented Development

Goal LU-7 Economically viable, vital, and attractive commercial centers throughout the City that serve the needs of the community.

Measure Description: The era of disjointed strip malls with seas of parking are coming to a quick end as we realize the benefits of transit oriented development. Transit oriented development is building shopping, entertainment, work, or school near transit stops, which encourages people to walk, bike, or take the bus to these places. Transit oriented development discourages driving and reduces emissions.

Number	Measure
LU-7.4	Discourage the construction of marginal, disjointed strip center commercial development within the City.
LU-7.8	Encourage consolidation of parking and reciprocal access agreements between adjacent business and commercial center property owners.
Action	**Target/Performance Criteria**
Update the City's Development Code to include design standards to reflect the City's desire to create quality commercial development.	Update Development Code by 2013.
Evaluate the parking requirements and the height setback requirements for commercial uses.	Complete evaluation by 2014.
GHG Reduction Potential	Supporting Measure

Transit Oriented Development

Goal LU-8 A community that provides opportunities for mixed use and/or transit-oriented development.

Measure Description: Transit oriented development is a new urban form for Murrieta which will help the City transition into the future. These measures will enable Murrieta to make these transitions while maintaining the qualities of the City that the residents support.

Number	Measure
LU-8.1	Encourage integrated development that incorporates a mix of uses (residential, commercial, office) in mixed use or transit-oriented development areas.
LU-8.2	Encourage workplace development in close proximity to residences in mixed use or transit-oriented development areas.
LU-8.4	Design mixed uses or transit-oriented development projects to: • Create a pleasant walking environment to encourage pedestrian activity. • Create lively streetscapes, interesting urban spaces, and attractive landscaping. • Provide convenient shopping opportunities for residents close to their residence. • Integrate with surrounding uses to become a part of the neighborhood rather than an isolated project. • Use architectural elements or themes from the surrounding area, as appropriate. • Provide appropriate transition between land use designations to minimize neighbor compatibility conflicts.
LU-8.5	Encourage the creation of multi-modal transit opportunities with a healthy mix of businesses, childcare, senior services, and housing.
LU-8.6	Encourage higher density residential, commercial, and employment development near a future Metrolink or High Speed Rail Station, along other major public transportation routes, and at other suitable locations.
LU-8.7	Amend the Development Code to implement mixed use zoning districts that provide development standards for mixed use development, which should address minimum density and intensity requirements; allowable uses; horizontal and/or vertical mix of uses, building heights; and parking standards.
LU-8.8	Evaluate mixed use projects to ensure that there is an adequate mix of uses on the site and in the area.
Action	**Target/Performance Criteria**
Update the Development Code to include the above policies as design standards.	Update Development Code by 2013.
GHG Reduction Potential	784 $MTCO_2eq$

Pedestrian-Friendly Environment

Goal LU-9 Land use patterns and urban design that support healthy and sustainable lifestyles and businesses.

Measure Description: Pedestrian-friendly environments are those that support walking trips along human scaled urban design in contrast to auto-oriented urban design. This measure contributes emissions reductions when implemented in conjunction with the other measures within this strategy.

Number	Measure
LU-9.1	Encourage human-scale urban design on the neighborhood, block, and building scale.
LU-9.2	Encourage active and inviting pedestrian-friendly street environments that include a variety of uses within commercial, mixed use or transit-oriented development areas.

Number	Measure
LU-9.3	Encourage new neighborhoods to be built on a pedestrian-scale, within walking distance of parks, neighborhood-serving commercial areas, and other neighborhood amenities.
LU-9.4	Differentiate between areas zoned as neighborhood commercial and community commercial, encouraging unique, pedestrian-oriented, and neighborhood-serving uses in the neighborhood commercial zone.
LU-9.5	Promote commercial uses near residential neighborhoods that serve local residents and create neighborhood-gathering places.
LU-9.6	Provide pedestrian-oriented urban design through creative use of site development standards.
LU-9.7	Encourage development patterns to become more conducive to short, local, and walkable trips, which could increase opportunities for physical activity and decrease time spent driving.
LU-9.8	Consider infill locations for higher education facilities to capitalize upon existing or create synergies with surrounding uses.
Action	**Target/Performance Criteria**
Update the Development Code to reflect the City's desire to create sustainable development.	Update Development Code by 2013.
GHG Reduction Potential	2,334 $MTCO_2eq$

Pedestrian-Friendly Environment

Goal LU-10 A community that provides pedestrian-friendly environments for residential, commercial, business, and recreation uses.

Measure Description: Pursue economic vitality and longevity by attracting higher education and growing a base of clean industry, while maintaining the current housing affordability.

Number	Measure
LU-10.1	Prepare and use design guidelines to encourage high-quality, pedestrian-oriented design that enhances the public realm.
LU-10.2	Consider preparation and adoption of a Street Master Plan that addresses walkability and streetscape.
LU-10.3	Consider that the development of new residential block lengths are no more than 800 feet on any one side, and no longer than 600 feet on average per side, creating a street network that enables multiple routes for pedestrians, cyclists, and vehicles through a neighborhood.
LU-10.4	Discourage physical barriers, such as arterial streets, transit or utility rights-of-way, or very long blocks without through-streets, between and within neighborhoods and neighborhood centers. If physical barriers are unavoidable, provide safe and comfortable crossings for pedestrians and cyclists.
LU-10.5	Update the Development Code to create walkability, and interesting and varied pedestrian environments.
LU-10.6	Encourage new businesses to have a pedestrian-accessible main entrance that faces the street, as appropriate.
LU-10.7	Encourage well-designed covered or structured parking instead of surface parking lots.
LU-10.8	Encourage new surface off-street parking to be located behind or to the side of buildings, as appropriate.
LU-10.9	Encourage ground-floor structured parking to be buffered from the pedestrian environment through

Number	Measure
	strategies such as wrapping the structure with active retail uses, placing entrances off the street, and screening with landscaping or art.
Action	**Target/Performance Criteria**
Update the City's Development Code to include the above policies as design standards.	Update Development Code by 2013.
Prepare design guidelines for pedestrian-friendly environments.	Complete design guidelines by 2014.
Prepare a Street Master Plan.	Complete Street Master Plan by 2015.
GHG Reduction Potential	Supporting Measure

Sustainable Economy

Goal ED-3 A sound, stable, and diversified economic base.

Measure Description: A stable economic base can support the range of businesses needed to achieve a jobs/housing balance in the City. With more local employment opportunities, the City would be able to provide a greater variety of services to its residents, further reducing vehicle miles traveled and capturing sales tax revenues.

Number	Measure
ED-3.1	Support a diverse range of business activities including professional/technical, information, technology-focused manufacturing, research and development, including medical research institutions, educational services, medical/health services, and financial services.
ED-3.2	Promote Murrieta as a center for medical/health services and technology through active encouragement and recruitment of medical office, medical research, and health care facilities around the Loma Linda University Medical Center, South Murrieta Business Corridor, and confluence of the I-15/I-215 Freeways.
ED-3.3	Create incentives to attract new businesses and industries that provide employment opportunities that match the education and occupational skill levels of Murrieta residents.
ED-3.4	Develop an economic base that attracts jobs and exports products and services by capitalizing on the City's strategic location and relatively lower land prices between greater Los Angeles/Orange County metro and San Diego market regions.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Sustainable Economy

Goal ED-4 Positive balance between the supply of retail opportunities and demand for goods and services.

Measure Description: A balanced between the supply of retail opportunities and demand for goods and services will reduce the need to travel outside of the City.

Number	Measure
ED-4.2	Encourage retail development, expansion, and remodeling projects that can effectively reverse or minimize outflows of local resident expenditures to retail facilities beyond the City limit.
Action	**Target/Performance Criteria**
Conduct a study to determine the appropriate ratio of retail services to other development.	Complete retail services study by 2015.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal ED-5 An improved jobs/housing balance.

Measure Description: The jobs/housing ratio in Murrieta would be further balanced by encouraging and properly locating flex-tech and higher intensity office within the City. This measure would increase the job opportunities within the City.

Number	Measure
ED-5.1	Encourage flex-tech buildings within business corridors and higher intensity office uses along freeway corridors with adequate visibility, convenient access, and future transit-oriented opportunities.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal ED-6 An educated and highly-skilled labor force.

Measure Description: An educated and highly-skilled labor force within the City will be able to take advantage of the City's planned employment opportunities. This measure supports a jobs/housing balance within the City.

Number	Measure
ED-6.1	Encourage and support the development of institutions of higher education to serve educational pursuits of area residents and provide a highly skilled employment pool attractive to business investment and economic growth.
ED-6.2	Support the development of technical colleges and training institutions that build job skills commensurate with the growth of the economic base, particularly in the emerging health care services industry and the need for doctors, nurses, and other trained personnel.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal ED-8 Strategic approach to economic growth.

Measure Description: Office and research and development uses within the City help maintain quality employment opportunities. With more local employment opportunities, the City would be able to provide a greater variety of services to its residents, further reducing vehicle miles traveled.

Number	Measure
ED-8.1	Encourage and market to employers that provide employment opportunities commensurate with the education and skills of Murrieta residents.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Sustainable Economy

Goal ED-10 A revitalized and economically stable Historic Downtown Murrieta.

Measure Description: Higher-density and mixed-use development within Historic Downtown Murrieta would allow this area of the City to grow as a viable and self sustaining district.

Number	Measure
ED-10.6	Consider opportunities for the development of higher-density and mixed-use residential uses to support commercial development within the Historic Downtown.

Action	Target/Performance Criteria
Develop an incentives program for higher-density and mixed-use development in the Historic Downtown.	Develop incentives program by 2014.
GHG Reduction Potential	Supporting Measure

Green Economy

Goal AQ-6 Stationary source pollution (point source and area source) are minimized through existing and future regulations and new technology.

Measure Description: The inclusion of non-polluting industry and clean green technology would contribute to the diverse economic base envisioned for the City. The inclusion of employment opportunities would also reduce commuting.

Number	Measure
AQ-6.3	Encourage non-polluting industry and clean green technology companies to locate to the City.
Action	**Target/Performance Criteria**
Develop an incentives program to locate clean green technology companies within the City.	Develop incentives Program by 2014.
GHG Reduction Potential	Supporting Measure

3. TRANSPORTATION AND MOBILITY STRATEGY

Reducing the number and length of vehicle trips and engine idling reduces those emissions. Efficient transportation systems also conserve fuel and reduce travel costs and expensive road repairs. Generally, there are three methods to reduce GHG emissions from the transportation sector. One method is to implement policies that reduce dependence on personal motor vehicles and encourage alternative modes of transportation, such as public transit, cycling, and walking. Another method is to utilize vehicles that release fewer GHGs, such as hybrids, more fuel efficient vehicles, and vehicles that run on alternative fuels. A final method is to encourage 'smart growth' or policies that promote efficient land use development. Smart growth reduces the need to travel long distances, facilitates transit and other non-automotive travel, increases the availability of affordable housing, employs existing infrastructure capacity, promotes social equity, helps protect natural assets, and maintains and reinforces existing communities.

Increase Trail Connectivity

Goal LU-22 Natural and visual resources are valued resources to maintain the rural character of the Los Alamos Hills.

Measure Description: A City-wide pedestrian master plan will establish connectivity throughout the City. Various improvements identified within the master plan supports biking and walking along trails that connect to end-uses. This measure supports the other measures within this strategy.

Number	Measure
LU-22.6	Encourage the development of an trail system within the Multiple Species Habitat Conservation Plan (MSHCP) and other open space areas that connects to a trails system within or adjacent to the existing and future street systems, including linkage through areas east of Warm Springs Creek (such as but not limited to a transitional buffer area) to the open space corridor along Adobe Creek. Trails adjacent to streets should allow for multiple users and provide buffers between vehicles and trail users.

Action	Target/Performance Criteria
Develop a City-wide pedestrian master plan that improves the convenience, safety, and attractiveness of and access to pedestrian ways. Update the plan on a regular basis to ensure that walkability improves over time.	Complete Pedestrian Master Plan by 2015.
GHG Reduction Potential	Supporting Measure

Reduce Driving

Goal LU-24 Historic Murrieta as the City's cultural, civic and community center.

Measure Description: Traditional town development patterns include short distances between destinations, reduce distances of vehicle trips, and encourage walking. This measure supports the other measures within this strategy.

Number	Measure
LU-24.2	Continue the expansion of a traditional town development pattern with a grid street design and urban land use intensities to support a pedestrian-oriented environment.
LU-24.6	Encourage mixed-use development projects within the Historic Downtown that create a pedestrian style living environment and encourage use of mass transit.
Action	**Target/Performance Criteria**
Update the Development Code to include provisions for traditional development patterns.	Update Development Code by 2013.
GHG Reduction Potential	Supporting Measure

Support High Speed Rail

Goal LU-25 Collaboration with Federal, State, County, and other regional agencies and authorities to ensure compliance with existing and future legislation that affects the City of Murrieta.

Measure Description: According to the California High Speed Rail Authority, a High Speed Rail (HSR) station is planned to be located at the I-15/I-215 interchange. Approximately 8,000 boardings per day are planned at this station.[2] The HSR would reduce the number of region- and state-wide trips that begin and end in the City.

Number	Measure
LU-25.2	Establish a strong role in the implementation of Proposition 1A with the California High Speed Rail Authority (CHSRA).

[2] California High Speed Rail Authority, *Interactive Map*, http://www.cahighspeedrail.ca.gov/trip_planner.aspx, Accessed January 17, 2011.

Action	Target/Performance Criteria
Work with the Riverside Transit Agency (RTA) to expand transit routes to connect with the potential high speed rail site and other destinations within the City.	By 2020 determine necessary transit route expansion/ modifications prior to the completion of the high speed rail station.
GHG Reduction Potential	Supporting Measure

Support Multi-Modal Transportation

Goal CIR-1 A circulation system that serves the internal circulation needs of the City, while also addressing the inter-community or through travel needs.

Measure Description: A well-designed and connected transportation system reduces traffic delays and allows traffic to flow efficiently throughout the City.

Number	Measure
CIR-1.1	Ensure the transportation system can adequately serve the concentrations of population and employment activities identified by the Land Use Element.
CIR-1.9	Provide a coordinated traffic control system that moves traffic within and through the City in an efficient and orderly manner. Upgrade systems as technology evolves.
CIR-1.11	Support the implementation of complete streets through a multi-modal transportation network that balances the needs of pedestrians, bicyclists, transit riders, mobility-challenged persons, older people, children, and vehicles while providing sufficient mobility and abundant access options for existing and future users of the street system.

Action	Target/Performance Criteria
Conduct a transportation study to determine system adequacy.	Complete study by 2015.
Implement Intelligent Transportation System (ITS) elements to coordinate traffic signals along major transportation corridors.	Complete improvements by 2018.
Construct pedestrian, bicycle, and transit improvements on major thoroughfares.	Complete improvements by 2018.
GHG Reduction Potential	7,470 $MTCO_2eq$

Promote Pedestrian Safety

Goal CIR-2 A comprehensive circulation system that promotes safety.

Measure Description: A safe and efficient circulation network reduces travel time and distance and encourages bicycle/pedestrian travel. Roadway network improvements reduce traffic, and provide a citywide system of bicycle lanes and recreational trails that improve accessibility without a car.

Number	Measure
CIR-2.3	Provide a circulation network that accommodates the safe and efficient movement of all forms of non-motorized travel.
CIR-2.5	Include paved shoulders on all roads in non-urban areas that can be used by cyclists and pedestrians.
CIR-2.6	Explore the use of traffic calming measures on streets with high incidences of speeding and/or history of collisions.
CIR-2.7	Publish and promote safe pedestrian and bike routes through creating an accurate citywide map and posting pedestrian/cyclist-scale wayfinding signage.
CIR-2.12	Consider the development and implementation of Pedestrian Safety Guidelines that also include streetscape standards that emphasize pedestrian and cyclist safety (lighting, trees, greenery, traffic calming measures, etc.).

Action	Target/Performance Criteria
Install circulation and traffic calming improvements.	Install improvements for 10 percent of the circulation system by 2020. Install improvements for 25 percent of the circulation system by 2035.
GHG Reduction Potential	14,939 $MTCO_2eq$

Improve Public Transportation

Goal CIR-5 A supported regional transportation system that serves existing and future travel between Murrieta and other population and employment centers within southwest Riverside County and the larger region, and that accommodates the regional travel needs of developing areas outside the City.

Measure Description: Development of a Metrolink station within the City would reduce vehicle trips that originate or end within the City.

Number	Measure
CIR-5.9	Coordinate with Western Riverside Council of Governments, Riverside County, and Riverside County Transportation Commission to identify, protect, and pursue opportunities for public transit along major transportation corridors, and future high speed rail service, which connect Murrieta to other population centers.
CIR-5.10	Support the siting and development of a Metrolink Station(s) within Murrieta along the I-15 and/or I-215 corridors.
CIR-5.11	Coordinate with California High Speed Rail Authority, Riverside Transit Authority, and City of Temecula on the siting and development of a California High Speed Rail Intermodal Transit Center.
Number	**Measure**
CIR-5.14	Encourage new large residential, commercial, or employment developments to locate on existing and planned transit routes.

Action	Target/Performance Criteria
Work with the Riverside Transit Authority to expand transit routes to connect with the potential high speed rail site and other destinations within the City.	By 2020 determine necessary transit route expansion/ modifications prior to the completion of the high speed rail station.
GHG Reduction Potential	1,867 $MTCO_2eq$

Reduce Driving

Goal CIR-6 Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.

Measure Description: Travel mode alternatives to the single-occupant automobile reduce vehicle trips, miles traveled, and congestion on the transit network.

Number	Measure
CIR-6.1	Encourage alternatives to single-occupancy vehicle transportation such as public transit, paratransit, walking, cycling, and ridesharing.
CIR-6.2	Support a variety of transit vehicle types and technologies to serve different transportation needs.
CIR-6.3	Work with the Riverside Transit Agency, Murrieta Chamber of Commerce, and/or the City's Economic Development Department to conduct a travel/commute survey with the intent of creating vanpools, carpools, and employment center shuttles to reduce single occupant vehicles.
CIR-6.4	Seek opportunities for funding that goes to support alternative forms of transportation.
CIR-6.5	Support the dedication and/or construction of appropriate facilities in support of a public transportation system.
CIR-6.6	Identify opportunities to implement the Western Riverside County Non-Motorized Transportation Plan within key activity centers of the City through the development of non-motorized transportation corridors and facilities (i.e., neighborhood electric vehicle routes, bikeways, pedestrian paths, sidewalks/paths).

Action	Target/Performance Criteria
Conduct a travel/commute survey to reduce single occupant vehicles.	Complete survey by 2015.
Upgrade transit access and expand transit network.	Increase transit network coverage by 25 percent by 2020.
GHG Reduction Potential	37,345 $MTCO_2eq$

Increase Walking

Goal CIR-7 Residential areas and activity centers are accessible to all pedestrians, including persons with disabilities or having special accessibility needs.

Measure Description: Internal pedestrian linkages and pedestrian friendly design reduces the need for vehicle trips.

Number	Measure
CIR-7.1	Encourage future developments to provide an internal system of sidewalks/pathways linking schools, shopping centers, and other public facilities with residences.
CIR-7.2	Require pedestrian access from the interior of new residential areas to public transit stops.
CIR-7.3	Encourage safe pedestrian walkways and ensure compliance with the Americans with Disabilities Act (ADA) requirements within all developments.
CIR-7.4	Consider the development and implementation of Pedestrian Friendly Street Standards.
CIR-7.5	Provide pedestrian amenities such as benches, trees, landscaping, and shade trees to encourage people to walk to destinations.
CIR-7.6	Promote improved demand responsive transit services for elderly and disabled persons.
CIR-7.7	Ensure visibility and access for pedestrians and encourage the removal of barriers (walls, fences) to allow for safe and convenient movement.
CIR-7.8	Work with Riverside County Transportation Commission, local retirement homes, the Senior Center, and other community groups to expand affordable and reliable transportation options for older adults and disabled persons.
Action	**Target/Performance Criteria**
Incorporate pedestrian friendly street standards into the Development Code.	Update Development Code by 2013.
GHG Reduction Potential	934 $MTCO_2eq$

Increase Trail Connectivity

Goal CIR-8 Development, expansion, and maintenance of a network of bicycle, pedestrian, and multi-use trails that allows residents to travel between parks, schools, neighborhoods, and other major destinations without driving.

Measure Description: Interconnected trails improve connectivity within the City, accommodate biking and walking, and provide alternatives to single-occupancy automobile travel. Connectivity between major destinations can reduce vehicle trips.

Number	Measure
CIR-8.1	Create, update, and implement a master plan for non-motorized travel throughout the City, including multi-use trails, off-street paved bikeways, on-street bikeways, and related amenities.
CIR-8.2	Promote bicycle and pedestrian trails along major home to work and other travel routes.
CIR-8.10	Work with adjacent property owners to create an interconnected trail that extends along the public right-of-way, which will benefit business by increasing exposure and access, and benefit the community through encouraging fitness, improved access, and a connected community.
CIR-8.11	Coordinate the location of multi-use trails to connect with regional trail systems where feasible.
CIR-8.12	Pursue funding or grant opportunities to plan, construct, and maintain pedestrian, bicycle, and multi-use trails.

Number	Measure	
CIR-8.13	Maintain a map or maps of current bikeways and multi-use trails, and make the map(s) available to the public.	
Action		**Target/Performance Criteria**
Develop a pedestrian and bicycle trail plan.		Develop plan by 2015.
GHG Reduction Potential		6,536 $MTCO_2eq$

Goal AQ-4 Mobile source emissions are reduced by providing a balance of jobs and housing that serve the needs of the community.

Measure Description: A balance of jobs and housing allows residents to live and work within the City. Local employment opportunities that mach the needs of the residents reduces commuting time, vehicle trips, and vehicle miles traveled.

Number	Measure	
AQ-4.1	Cooperate with local, regional, State, and Federal agencies to reduce vehicle miles traveled (VMT) and consequent emissions through job creation.	
AQ-4.2	Improve jobs/housing balance by encouraging the development, expansion, and retention of business.	
AQ-4.3	Improve access of businesses to institutions that provide education and job training to prepare local residents to fill the jobs local industries create.	
AQ-4.4	Encourage a mix of housing types that are affordable to all segments of the population and are near job opportunities to further reduce vehicle trips.	
Action		**Target/Performance Criteria**
Amend the Municipal Code to include a TDM ordinance to reduce VMT.		Amend the Municipal Code by 2013.
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).		Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential		18,674 $MTCO_2eq$

Improve Air Quality by Reducing Driving

Goal AQ-5 Air quality is improved through an efficient circulation system, reduced traffic congestion, and reduced vehicle miles traveled.

Measure Description: The implementation of Transportation Demand Management (TDM) measures reduces vehicle trips and vehicle miles traveled throughout the City. TDM measures improve the efficiency of transportation resources and also focus on providing alternatives to vehicle trips.

Number	Measure
AQ-5.1	Encourage employers to implement transportation demand management (TDM) measures, such as the following programs to reduce trips and vehicle miles traveled: • Transient subsidies • Bicycle facilities • Alternative work schedules • Ridesharing • Telecommuting and work-at-home programs • Employee education • Preferential parking for carpools/vanpools
AQ-5.3	Promote use of fuel-efficient and low-emissions vehicles, including Neighborhood Electric Vehicles.
AQ-5.4	Encourage the use of lowest emission technology buses in public transit fleets.
AQ-5.6	Manage the municipal vehicle fleet to achieve the highest possible number of fuel-efficient and low emissions vehicles commercially available. staff to check with public works
AQ-5.7	Reduce industrial truck idling by enforcing California's five (5) minute maximum law, requiring warehouse and distribution facilities to provide adequate on site truck parking, and requiring refrigerated warehouses to provide generators for refrigerated trucks.

Action	Target/Performance Criteria
Amend the Municipal Code to include a TDM ordinance.	Amend the Municipal Code by 2013.
Implement Neighborhood Electric Vehicle networks in new developments.	Include Neighborhood Electric Vehicle networks in 5 percent of new developments.
GHG Reduction Potential	47 $MTCO_2eq$

4. ENERGY USE AND CONSERVATION STRATEGY

Energy Efficiency

Energy generation is the second largest source of GHG emissions. Thus, strategies to conserve energy and use it more efficiently in Murrieta's operations and the community help reduce GHG emissions. In addition, energy efficiency and conservation measures save money and resources. City buildings, equipment, and infrastructure all use energy. Typically, newer purchases and installations tend to be more energy efficient, but opportunities to enhance efficiency still exist. Buildings can be made more efficient by upgrading insulation and installing low emissive glass, using high-efficiency lighting with timers and sensors, installing cool roofs, and simply adjusting heating and cooling levels. Additionally, movement, storage, and treatment of water and wastewater use significant amounts of energy. Murrieta can reduce municipal water use by installing low-flow fixtures and by inspecting, repairing, and replacing leaking components. Landscaping irrigation measures such as water reclamation systems and xeriscaping can also reduce water usage.

Increasing energy efficiency throughout the community has immense potential to both reduce GHG emissions and save money. A wealth of resources exists to assist municipalities in this regard. For example, the Energy Star program offers energy efficient products and tools for improving energy management. Promoting Energy Star resources to both businesses and residents is a good way to achieve increased energy efficiency. Other methods to increase community energy efficiency include subsidizing energy management services such as energy audits for residents and businesses. Ensuring that developers and building contractors are trained on energy conservation and efficiency is also within the City's purview.

A commitment to highly efficient construction in municipal facilities is one way the City can reduce GHG emissions from the built environment. Building or retrofitting facilities to Leadership in Energy and Environmental Design (LEED) certification standards and siting new facilities to improve access would improve efficiency. In addition, the City could adopt the 2010 California Green Building Standards Code (CALGreen Building Standards) voluntary measures for residential and non-residential buildings as mandatory.

Alternative Energy

Sources of renewable energy include solar, wind, biomass and geothermal. Hydrogen fuel cells and tidal current power are renewable energy sources that hold promise but require further research and innovation before they are as practical and possible to implement as other options.

Renewable energy sources offer the potential for a clean, decentralized energy source that can significantly impact the municipality's GHG emissions. Murrieta will work to build on current efforts to integrate alternative energy into the community's power scheme. Alternative energy sources can be developed, such as installation of solar arrays, or landfill gas to energy projects. Energy generated from renewable sources produces less GHG emissions than energy generated from conventional sources; low carbon fuels are those that are formulated to produce fewer GHG emissions.

Renewable Energy and Efficiency

Goal CSV-12 Energy conservation and the generation of energy from renewable sources is prioritized as part of an overall strategy to reduce greenhouse gas emissions.

Measure Description: Energy conservation is the simplest method to reduce GHG emissions from energy usage. Conservation entails modification of behaviors as well as energy retrofits. Energy efficiency improvements to residential and commercial structures can reduce energy bills and GHG emissions. Obtaining energy from renewable resources can complement energy conservation and can further increase sustainability. The City will ensure that all developments comply with energy efficiency requirements and encourage the installation of renewable energy generation systems. Community awareness of opportunities to conserve energy and use renewable energy will be promoted by the City.

Number	Measure
CSV-12.1	Ensure that all developments comply with energy efficiency requirements as mandated by the applicable Building Code.
CSV-12.2	Work with energy utilities to encourage and incentivize the retrofitting of building systems with energy-conserving fixtures and appliances.
CSV-12.3	Support the on-site installation and use of renewable energy generation systems for residential, commercial, institutional, and industrial uses.
CSV-12.4	Explore options for addressing aesthetic concerns about renewable energy systems that do not unreasonably restrict the use of these systems, remaining consistent with State law.
CSV-12.5	Consider non-commercial solar power generation in residential areas.
CSV-12.6	Encourage new development projects and significant rehabilitation or expansion projects to incorporate innovative energy conservation or generation amenities such as electric vehicle charging stations, solar canopies, and carports.

Number	Measure
CSV-12.7	Support bulk purchasing or financing packages of renewable energy purchasing for residential, business and government facilities.
CSV-12.8	Promote community awareness of opportunities to conserve energy and use renewable energy.

Action	Target/Performance Criteria
Update the City's website to include links to information for energy efficiency rebates, incentives, and case studies.	Update website by 2013.
Work with Southern California Edison and community organizations to develop energy efficiency outreach programs for homes and businesses. The outreach programs should target such programs as smart grid integration, and incentives for voluntary inefficient appliance replacement.	Develop outreach programs by 2014.
Develop a group of required improvements that achieves a 15 percent improvement in efficiency. Such improvements can include: • Point-of-sale energy efficiency upgrades. • Use of cool roofs or any roof used to shade or cover parking have a Solar Reflectance Index (SRI) of at least 29. • Require outdoor lighting fixtures to be energy efficient. • Encourage participation in the California Energy Commission's New Solar Homes Partnership. • Encourage that new projects or rehabilitations of commercial, office, or industrial development incorporate solar or other renewable energy generation to provide 15 percent or more of the project's energy needs.	Develop required improvements by 2015.
Encourage the development of alternative energy projects.	Ongoing.
GHG Reduction Potential	54,588 $MTCO_2eq$

Green Building

Goal CSV-14 A community that encourages and incentivizes the sustainable development of buildings and neighborhoods, particularly with respect to durability, energy and water use, and transportation impacts.

Measure Description: Sustainable developments reduce the amount of energy and water required to operate and reduce transportation impacts, reduce GHG emissions. This measure

will ensure that Green Building is a priority in Murrieta's future. Citywide adoption of the California Green Building Standards is the simplest and most comprehensive way to reduce building energy demand. As a large proportion of the projected GHG emissions within the City are from building energy usage, this sector provides a great opportunity for emissions reductions.

Number	Measure
CSV-14.1	Ensure all applicable construction projects comply with the California State Green Building Standards Code.
CSV-14.2	Encourage the integration of other principles of green building into development standards and guidelines, looking for opportunities to realize other benefits such as improved health and increased bicycle transportation.
CSV-14.3	Identify and reduce regulatory barriers to green building.
CSV-14.4	Raise community awareness regarding green building methods, incentives, and benefits at community events, the planning counter, and on the City's website.
Action	**Target/Performance Criteria**
Amend the City's Development Code to include California Green Building Standards.	Amend the Development Code by 2013.
GHG Reduction Potential	120,120 $MTCO_2eq$

Energy Efficient Design

Housing Element

Goal 2: Conserve and enhance the quality of existing housing and residential neighborhoods in Murrieta.

Measure Description: This is a supporting measure that encourages energy conservation and highlights opportunities available in various government programs. Energy efficiency retrofitting of existing housing will require public outreach by the City to residents.

Number	Measure
Housing Element Policy 2.3:	Encourage energy efficient design in existing and new residential units and promote sustainability upgrades in existing and proposed residential complexes.
Housing Element Action 2.5– Energy Efficient Design	The City will review ordinances and recommend changes where necessary to encourage energy efficient housing design and practices that are consistent with state regulations. The City will periodically distribute literature or post information on their website regarding energy conservation, including solar power, energy efficient insulation, and subsidies available from utility companies, and encourage homeowners and landlords to incorporate these features into construction and remodeling projects. When possible the City will encourage energy conservation devices including, but not limited to lighting, water heater treatments, and solar energy systems for all residential projects. The Planning and Housing divisions will encourage maximum utilization of Federal, State, and local government programs, such as the

Number	Measure
	County of Riverside Home Weatherization Program, that assist homeowners in providing energy conservation measures. Additionally as part of the economic stimulus package offered by the federal government, the City of Murrieta is eligible for $881,500 in Energy Efficiency Community Development Block Grants (EECDBG). The City intends to apply for this funding in order to focus on sustainability, energy efficiency and greenhouse gas emission analysis in the General Plan update. • Responsible Agency: Murrieta Planning and Redevelopment and Housing Divisions • Timeframe: Ongoing, 2008-2014 • Potential Funding Source: EECDBG funds • Objective: Apply for $881,500 in funding to focus on energy efficiency and sustainability in the General Plan update.

Action	Target/Performance Criteria
Adopt an Energy Conservation Ordinance to ensure that new residential and commercial buildings are energy efficient.	Adopt Energy Conservation Ordinance by 2014.
GHG Reduction Potential	Supporting Measure

5. WATER USE AND EFFICIENCY STRATEGY

Water related emissions are mostly caused by energy used to pump, transport, heat, cool, and treat water and wastewater. In a dry climate, water demand and resulting emissions are magnified due to a relative shortage of naturally occurring water sources. Therefore, water conservation strategies have a double benefit of reducing energy demand and managing a limited resource. Approximately 58 percent of Murrieta's municipal emissions (6 percent of the total emissions) are related to water treatment and delivery.

The City will work with the local water purveyors (Western Municipal Water District, Eastern Municipal Water District, Rancho California Water District, and the Elsinore Valley Municipal Water District) to identify community actions that can reduce potable water demand, minimize wastewater generation, explore viable alternative sources of water, manage stormwater runoff, and help to maintain a healthy balance in the local aquatic ecosystem.

Increase Use of Recycled Water

Goal INF-2 Infrastructure for recycled water is expanded throughout Murrieta for irrigation and other non-potable uses.

Measure Description: The water purveyors for the City of Murrieta already utilize recycled water for irrigation and other purposes. This measure increases the use of recycled water by expanding the infrastructure necessary for treatment and distribution. Implementation of this measure would effectively reduce the demand for potable water.

Number	Measure
INF-2.1	Support water district efforts to promote the use of recycled water where infrastructure is available, and to expand infrastructure where it does not currently exist.
INF-2.2	Work with the water districts to explore options for expanding recycled water pipelines to serve City parks and facilities that are near existing infrastructure, such as California Oaks Sports Park and Town Square.
INF-2.3	Continue to require installation of recycled water systems for landscaping, unless there is an exemption from the applicable water district.
INF-2.4	Encourage other major users of irrigation, such as schools and private golf courses, to connect to nearby recycled water pipelines.
INF-2.5	Coordinate with water districts to encourage innovative demonstrations of non-potable uses for recycled water and/or groundwater recharge in City facilities and industrial applications.

Action	Target/Performance Criteria
Work with the water districts that serve the City to expand recycled water infrastructure throughout the City.	Expand infrastructure to supply at least 25 percent of the City's demands by 2020 (outdoor water use only).
GHG Reduction Potential	4,019 $MTCO_2eq$

Increase Water Conservation

Goal CSV-1 A community that conserves, protects, and manages water resources to meet long-term community needs, including surface waters, groundwater, imported water supplies, storm water, and waste water.

Measure Description: This measure focuses on the efficient use of water to reduce demand. Improvement of water use efficiency in Murrieta can reduce energy usage associated with water pumping, treatment, and distribution. Implementation of the California Green Building Standards Code results in substantial water savings.

Number	Measure
CSV-1.2	Promote the maximization of water supplies through conservation, water recycling, and groundwater recharge.
CSV-1.4	Support water purveyors in promoting a City-wide recycled water system through project review and coordination with water districts.

Action	Target/Performance Criteria
Adopt a water conservation strategy for new development that would reduce water consumption consistent with the voluntary standards in the California Green Building Standards Code.	Adopt water conservation strategy by 2014.
GHG Reduction Potential	10,097 $MTCO_2eq$

Reduce Water for Landscaping

Goal CSV-2 Murrieta promotes compliance with requirements from the State and appropriate agencies regarding comprehensive water conservation measures in buildings and landscaping.

Measure Description: Landscape irrigation water requires large amounts of energy to pump, treat, and distribute. Reducing landscape water consumption contributes to the GHG emissions reductions in the associated measures.

Number	Measure
CSV-2.1	Ensure that all developments comply with water efficiency requirements, as mandated by the applicable Building Code.
CSV-2.2	Work with water districts to encourage and incentivize the retrofitting of building systems, both indoor and outdoor, with water-conserving fixtures and appliances.
CSV-2.4	Promote water efficient landscaping practices through outreach efforts, project review, and enforcement of City, regional, or State code requirements.

Action	Target/Performance Criteria
Adopt a landscape water ordinance for new development that includes the water conservation practices of the California Green Building Standards Code.	Adopt landscape water ordinance by 2014.
GHG Reduction Potential	Supporting Measure

6. WASTE REDUCTION AND RECYCLING STRATEGY

The largest source of human-generated methane comes from improperly managed landfills. Organic waste that is trapped within a landfill without oxygen decomposes and creates methane gas, a GHG that is 23 times more potent than carbon dioxide. In addition, there are GHG emissions associated with foam products and refrigerants. Thus, waste reduction and recycling activities reduce the potential to generate methane at landfills, as well as reducing pollutants generated from transporting waste to disposal sites. Waste reduction and recycling activities also conserve natural resources. Emissions from this portion of the waste stream can be reduced through methane recovery, recovery of potent GHGs from foam and refrigerant systems, and other adjustments to collection systems.

The City of Murrieta currently disposes of 58.7 thousand tons of solid waste per year at 11 landfill sites within the region, and as far as Bakersfield and Simi Valley. Reducing the amount of waste sent to landfills would reduce transportation costs, landfill tipping fees, and methane gas production. The success of these measures is dependent on inducing change in the waste management practices of each citizen in the community.

Reduce Waste through Education

Goal INF-1 New development and redevelopment is coordinated with the provision of adequate infrastructure for water, sewer, storm water, and energy.

Measure Description: The City has the opportunity to reduce waste at the source by educating residents and businesses. Implemented best management practices for waste reduction can save the City money and reduce GHG emissions.

Number	Measure
INF-1.15	Continue to implement the City's residential informational and outreach program by providing homeowners with Best Management Practices (BMP) for activities such as, but not limited to: • Disposal of fats, oils, and grease • Disposal of garden waste • Disposal of household hazardous waste • Disposal of pet waste

Number	Measure
	• Garden care and maintenance • Vehicular repair and maintenance • Vehicular washing
Action	**Target/Performance Criteria**
Continue to implement solid waste informational and outreach programs.	Ongoing.
Continue to implement recycling programs in Municipal and Community Sectors.	Ongoing.
GHG Reduction Potential	Supporting Measure

Increase Waste Diversion

Goal CSV-13 Solid waste is diverted from landfills through waste reduction, re-use and recycling.

Measure Description: Educational programs and waste audits can be conducted in order to ensure that waste reduction and diversion targets are met. Food waste makes up approximately 20 percent of the waste stream. Compost made from food scraps can be sold to farms and vineyards for rebuilding soils and fertilizers. These measures would enable the City to continue on their waste reduction spree.

Number	Measure
CSV-13.1	Continue to comply with the landfill diversion requirements of the Integrated Waste Management Program.
CSV-13.2	Ensure that non-residential and multi-family developments provide readily accessible areas for recycling (at a minimum) paper, corrugated cardboard, glass, plastics and metals, as required by California law.
CSV-13.3	Maximize community reuse and recycling of products and materials through waste management contracts and public education.
CSV-13.4	Incentivize businesses that provide solutions for recycling and re-use of specific waste streams such as food waste and cooking oils.
CSV-13.5	Work with local landfills or green waste centers to develop the infrastructure for a composting program.
CSV-13.6	Provide public outreach and education workshops and information on new composting program.
CSV-13.7	Work with local landfills or green waste centers, or other interested parties, as appropriate, to implement a community wide food scrap collection and composting program.
Action	**Target/Performance Criteria**
Increase participation in the recycling services offered to residential and commercial customers.	Increase the City's waste stream diversion rate to 60 percent by 2020 and 75 percent by 2035.
GHG Reduction Potential	7,009 $MTCO_2eq$

7. OPEN SPACE STRATEGY

Open spaces in Murrieta consist of a variety of places throughout the City from the wild rolling hills to neighborhood parks, landscaped medians to natural waterway landscapes. Open spaces within the City can help improve stormwater quality, create a cooler microclimate, reduce building energy use, and improve public health. The policies within this strategy describe actions to increase and utilize open spaces within the City.

Increase Suburban Open Space

Goal CSV-9 **A community that promotes the growth of an urban forest and water-efficient landscaping, recognizing that plants provide natural services such as habitat, storm water management, soil retention, air filtration, and cooling, and also have aesthetic and economic value.**

Measure Description: Urban tree planting can promote shade, passively cool structures, and reduce the urban heat island effect. Additionally, over time, urban trees have the ability to sequester carbon and further reduce GHG emissions.

Number	Measure
CSV-9.1	Identify and protect native trees, trees of historic or cultural significance, and mature trees, consistent with the Tree Preservation Ordinance.
CSV-9.2	Consider the establishment of street tree standards and a program for street tree planting, maintenance, and replacement.
CSV-9.3	Promote the use of street trees as a buffer between pedestrians and motorized traffic.
CSV-9.4	Encourage the planting of street trees in linear planting beds rather than tree wells in order to support long-living healthy trees.
CSV-9.5	Encourage the planting of street trees in private yards and properties.
CSV-9.6	Maintain a guide to preferred trees, shrubs, and ground cover plants of non-invasive species, or refer private parties to an existing guide that meets City needs to assist private landscaping efforts.

Number	Measure
CSV-9.8	Encourage any new landscaped areas requiring permits to respect and incorporate the distinctive elements of the existing community landscape, including the retention of existing trees, to the maximum extent feasible.
CSV-9.9	Promote the use of native plant species in public landscaping of parks, schools, medians and planter strips, as well as in private development throughout the City.
Action	**Target/Performance Criteria**
Develop a landscape program based on the above policies.	Increase tree planting in the City 10 percent by 2020 and 20 percent by 2035.
GHG Reduction Potential	1,590 $MTCO_2eq$

Improve Local Food Security

Goal CSV-10 Fresh food is grown locally and made available through multiple venues that maintain a link to the City's agricultural heritage and promote healthy eating.

Measure Description: Local agriculture promotes the availability of fresh produce and reduces the demand for these goods to be transported into the City.

Number	Measure
CSV-10.1	Allow agricultural uses to continue in rural residential areas.
CSV-10.2	Consider ways to allow small-scale urban agriculture in parks, schools, and neighborhoods.
CSV-10.3	Ensure that residents are permitted to grow fruits and vegetables in their yards, so long as there are not significant negative impacts to adjacent property owners.
CSV-10.4	Encourage and support the use of public lands for community gardens and other food production facilities, when feasible.
CSV-10.5	Support opportunities for local food production and access, such as farmers' markets, community gardens, harvest sharing programs, and community-supported agriculture programs.
CSV-10.6	Encourage local farmers to sell fresh food locally.
CSV-10.7	Allow public facilities such as schools, libraries, and community centers to be used as Community Supported Agriculture pick-up sites.
Action	**Target/Performance Criteria**
N/A	N/A
GHG Reduction Potential	Supporting Measure

Preserve Open Space

Goal ROS-7 Open space areas are planned to protect, conserve, and utilize resources of unique character and value for the community.

Measure Description: Planned open space can expand the utilization of these areas for habitat, storm water management, soil retention, air filtration, and cooling, aesthetic and economic value, local food security, increased and improved parks, and preservation.

Number	Measure
ROS-7.1	Preserve and enhance open space resources in Murrieta.
ROS-7.2	Designate open space to preserve habitat and scenic views of natural areas.
ROS-7.3	Seek opportunities to designate open space along waterways, while also providing for the development of trails.
ROS-7.4	When possible, link open space and parks for the movement of wildlife and people.
Action	**Target/Performance Criteria**
Preserve the Open Space land use designations as outlined in the Open Space Element of the General Plan.	Ongoing.
GHG Reduction Potential	Supporting Measure

Integrate New Development and Open Space

Goal ROS-8 New development is part of a coordinated system of open space, parkland, recreation facilities, and trails.

Measure Description: Open spaces are also recreational destinations that are incorporated in bicycle/pedestrian plans. Open space areas can promote connectivity between locations and act as amenities along multi-use trails.

Number	Measure
ROS-8.1	Encourage the provision of parks, recreation facilities, and/or open space in new development and redevelopment projects.
ROS-8.2	Ensure that new residential developments provide for recreation needs of residents through development fees and park dedication.
ROS-8.3	Encourage development that promotes outdoor activity.
ROS-8.4	When reviewing new development or redevelopment projects, refer to the Trails Plan to determine whether right-of-way is needed for trails on the project site.

Action	Target/Performance Criteria
Preserve the Open Space land use designations as outlined in the Open Space Element of the General Plan.	Ongoing.
GHG Reduction Potential	Supporting Measure

Create New Open Spaces

Goal ROS-9 Public plazas or green spaces provide additional open space opportunities for existing and future residents and employees.

Measure Description: Public plazas and green spaces provide amenities and are linked with trails and pedestrian paths to promote connectivity.

Number	Measure
ROS-9.1	Continue to require that adequate, usable, and permanent private open space is provided in residential developments.
ROS-9.2	Encourage new and existing commercial, office, and industrial development to provide outdoor green spaces that may be used by employees.
ROS-9.3	Encourage new development and redevelopment projects to incorporate gardens and green spaces with various cultural influences throughout the community to bridge cultures and provide education opportunities.
ROS-9.4	Encourage green spaces planted with a diverse plant palette in order to promote natural variety, ecosystem services, and enhance the well-being of community residents.
ROS-9.5	Review and modify as necessary, open space requirements for different types of development projects.

Action	Target/Performance Criteria
Preserve the Open Space land use designations as outlined in the Open Space Element of the General Plan.	Ongoing.
GHG Reduction Potential	Supporting Measure

ADDITIONAL EMISSIONS REDUCTIONS FROM STATEWIDE LEGISLATION

Implementation of the recommended measures and actions will result in a potential reduction in GHG emissions of up to 885,247 $MTCO_2eq$. As a result, the City of Murrieta would not achieve the emission reduction target of 15 percent below 2009 emission levels with these measures alone. Therefore, the community will assume credit for a portion of the GHG emission reductions that will occur through legislation being implemented at the state-wide level.

The State of California has established companion legislation that will reduce statewide generation of GHG emissions across all emissions sectors in order to implement AB 32. Senate Bill 107 (SB 107) establishes performance standards for GHG emission reductions from electric utilities. Assembly Bill 1493 (AB 1493) establishes performance standards for GHG emission reductions from motor vehicles. Executive Order S-1-07 (EO S-1-07) establishes performance standards for the carbon intensity of transportation fuels. At the time of CAP preparation, the City only has confidence in estimating the GHG emission reductions associated with SB 107, AB 1493, and EO S-1-07. As the regulatory framework surrounding AB 32 grows in the future, it may be possible to evaluate a wider range of statewide reductions.

Senate Bill 1078 and Senate Bill 107

California utilities must meet increasingly stringent renewable energy requirements set by SB 1078 and SB 107. SB 1078 required investor-owned utilities to provide at least 20 percent of their electricity from renewable resources by 2020. SB 107 accelerated the timeframe by ten years to take effect in 2010. Sources of renewable energy include wind, solar, geothermal, or any Renewable Portfolio Standard (RPS) eligible sources.

Southern California Edison (SCE), Murrieta's electricity provider, delivered 16 percent of its electricity from renewable sources in 2008, and has contracts in place to deliver 20 percent by 2020 as required by law. At a minimum, this performance criterion would also be in effect at the CAP target year (2020) as well as the General Plan buildout year (2035). Additionally, EO S-14-08 would increase the RPS further to 33 percent by 2020. In response to EO S-14-08, CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

Table 3-2, Electricity Emission Reductions from State Legislation, provides the estimated emissions reduction effect of SB 107 and EO S-14-08 on Murrieta's 2020 and 2035 GHG emissions.

Table 3-2
Electricity Emissions Reductions from State Legislation

Emissions Sector	Building Energy Emissions				
	BAU (16 Percent Renewable) ($MTCO_2eq$/year)			33 Percent Renewable ($MTCO_2eq$/year)	
	2009	2020	2035	2020	2035
Residential	80,172	92,483	109,272	76,761	90,696
Commercial	61,855	149,594	269,238	124,163	223,467
Industrial	1,858	2,276	2,846	1,889	2,362
Municipal	38,039	42,164	47,788	34,996	39,664
Total	*143,885*	*244,353*	*381,356*	237,809	356,189

BAU = business as usual; RPS = renewable portfolio standard; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent
Source: ICLEI Clean Air and Climate Protection Software.

Assembly Bill 1493

GHG emissions will be reduced from on-road passenger motor vehicles sold in California with the implementation of Assembly Bill 1493 (AB 1493). The emission reduction potential associated with implementation of the vehicle emission standards would vary depending on the first regulated model year and vehicle turnover between the present fleet and the fleet in 2020 and 2035.

To provide an estimate of the reasonably foreseeable GHG emission reduction potential of motor vehicle emission regulations, the GHG emission reductions associated with AB 1493 were estimated using the California Air Resources Board (CARB) Pavley + Low Carbon Fuel Standard Postprocessor software (Version 1.0). It is expected that implementation of AB 1493 would reduce on-road mobile-source GHG emissions by approximately 17.66 percent by 2020 and approximately 20.66 percent by 2035. *Table 3-3*, *Transportation Emissions Reductions from State Legislation*, shows the estimated GHG emission reduction potential of AB 1493 in Murrieta.

Table 3-3
Transportation Emissions Reductions from State Legislation

Year	Murrieta Transportation Sector Emissions	GHG Emissions Reductions ($MTCO_2eq$/year)	GHG Emissions After Reductions ($MTCO_2eq$/year)	Percent Change[1]
2020	296,652	52,382	244,270	17.66%
2035	444,625	91,842	352,783	20.66%

GHG = Greenhouse Gas; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent per year

Notes:
1. Transportation emissions in this instance are based on an EMFAC2007 model run and were not calculated using the ICLEI CACP software. As a result, transportation emissions may not match the results from the CACP software presented in the emissions inventory. Emissions provided in this table have been included to depict the percent emissions reductions achieved in Murrieta due to the implementation of the Pavley standards.

Source: California Air Resources Board, *Pavley I and Low Carbon Fuel Standard Postprocessor Software (Version 1.0)*, April 2010, California Air Resources Board, *EMFAC2007*, November 2006, and VMT data for the City of Murrieta provided by Iteris.

Executive Order S-1-07

Under Executive Order S-1-07 (EO S-1-07), ARB has developed a Low Carbon Fuel Standard (LCFS) to reduce the carbon intensity of transportation fuels in California's by at least ten percent by 2020. The development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions is incentivized by the LCFS which is a performance standard with flexible compliance mechanisms. *Table 3-3*, also includes the estimated GHG emission reduction potential of EO S-1-07 on Murrieta's 2020 and 2035 GHG emissions.

Statewide Reductions in Relation to the CAP

The emission reductions shown above in *Table 3-2* and *Table 3-3* represent the upper bound of the potential emission reductions associated with SB 107 and AB 1493. Similar to the method used to quantify the City's CAP measures, the statewide emissions reduction estimates assume that no other emission reduction activities would occur. In reality, implementation of the City's CAP measures and the State regulations could occur, simultaneously or one preceding another. Thus, GHG reductions from emissions sectors affected by both City CAP measures and State regulations would not have a purely additive effect.

Rather, emission reductions achieved by one (i.e., CAP measures or State regulations) would reduce the capacity of the other to reduce emissions. For example, if SB 107 reduces electricity consumption-related emissions by 6 percent then the potential for additional GHG reduction by the City's electricity conservation-related CAP measures would be reduced. Conversely if the City's CAP measures reduce the quantity of electricity consumption-related GHG emissions the overall effectiveness of SB 107 is reduced.

The timing and synergistic effect of the State regulations in relation to the City's CAP measures are uncertain. Nonetheless, because the focus of the CAP is on actions the City can take to reduce community-wide GHG emissions, the emission reductions achieved by the City's actions were determined first and independent of Statewide reductions.

SUMMARY OF RESULTS

Table 3-4, *Summary of GHG Reduction Measures,* summarizes the GHG reductions anticipated by implementing the quantified measures recommended in the CAP, and provides subtotals for each strategy. This level of GHG reduction can only be realized if the targets and performance criteria are achieved throughout the course of implementing the CAP.

The GHG reduction strategies and measures were based on the Goals and Policies in the General Plan Update and were designed to include performance criteria that would allow the City to achieve its GHG reduction target of 15 percent below 2009 levels by 2020. As proposed, the CAP meets this target, with a projected 15.21 percent reduction. The CAP includes other supporting measures that contribute to the GHG emission reductions of other related measures. Other measures could not be quantified, due either to a lack of substantial evidence or limitations inherent in quantifying the effect of less tangible programs and policies. For the CAP to successfully guide Murrieta toward meeting its GHG reduction target, the City must play a prominent role in implementing the CAP's programs and policies. The public also has a role by participating in and ensuring success of the measures and actions.

Table 3-4
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
Community Involvement Strategy			
CIR-6	Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.	Supporting Measure	N/A
CSV-15	A community taking a leadership role in resource conservation and reduction of greenhouse gas emissions by implementing programs to improve municipal operations.	97	0.02%
HC-1	Application of innovative and model best practices in the community health field.	253	0.05%
	Subtotal	**350**	**0.07%**
Land Use and Community Vision Strategy			
LU-1	A complementary balance of land uses throughout the community that meets the needs of existing residents and businesses as well as anticipated growth, and achieves the community's vision.	18,674	3.98%
LU-4	A housing stock that meets the diverse needs of Murrieta's existing and future residents.	Supporting Measure	N/A

Table 3-4 [continued]
Summary of GHG Reduction Measure Performance

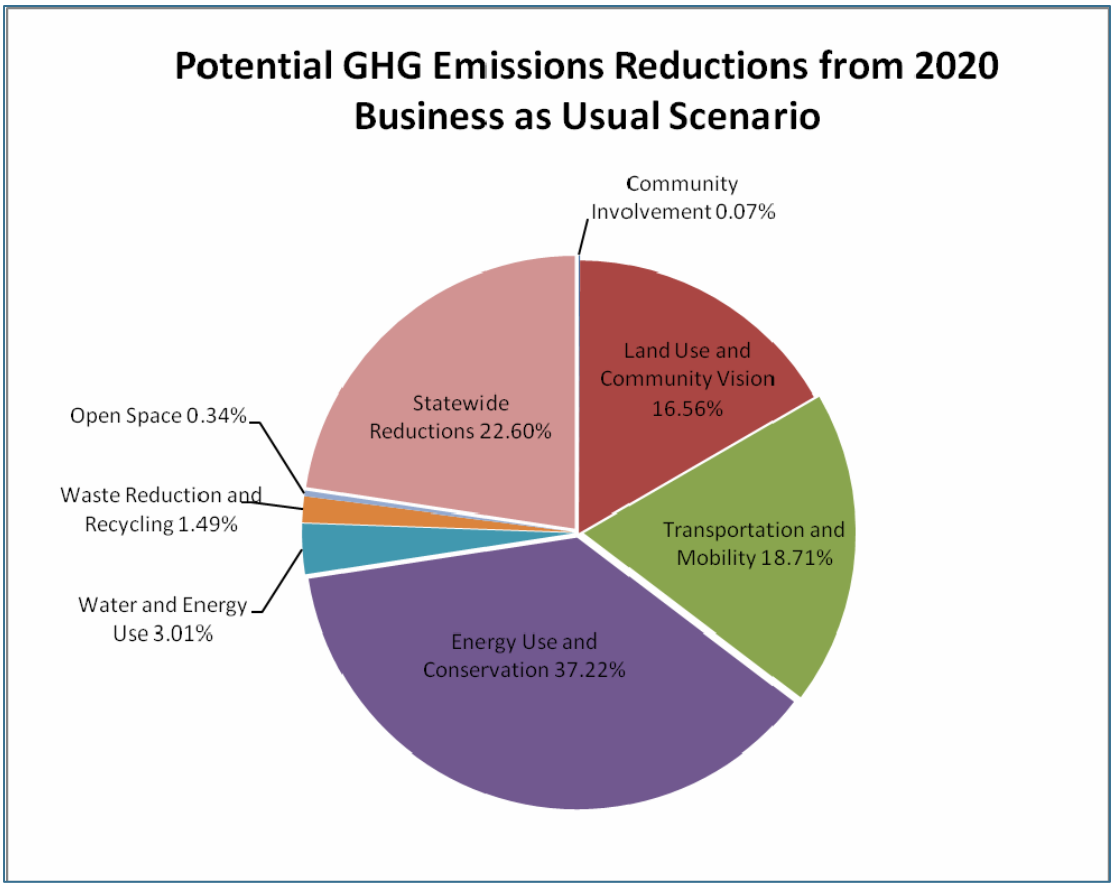
Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
LU-5	Promotion of quality industrial development that provides local employment opportunities.	3,641	0.78%
LU-6	Land use policy that encourages job retention and attraction.	52,288	11.14%
LU-7	Economically viable, vital, and attractive commercial centers throughout the City that serve the needs of the community.	Supporting Measure	N/A
LU-8	A community that provides opportunities for mixed use and/or transit-oriented development.	784	0.17%
LU-9	Land use patterns and urban design that support healthy and sustainable lifestyles and businesses.	2,334	0.50%
LU-10	A community that provides pedestrian-friendly environments for residential, commercial, business, and recreation uses.	Supporting Measure	N/A
ED-3	A sound, stable, and diversified economic base.	Supporting Measure	N/A
ED-4	Positive balance between the supply of retail opportunities and demand for goods and services.	Supporting Measure	N/A
ED-5	An improved jobs/housing balance.	Supporting Measure	N/A
ED-6	An educated and highly-skilled labor force.	Supporting Measure	N/A
ED-8	Strategic Approach to Economic Growth	Supporting Measure	N/A
ED-10	A revitalized and economically stable Historic Downtown Murrieta.	Supporting Measure	N/A
AQ-6	Stationary source pollution (point source and area source) are minimized through existing and future regulations and new technology.	Supporting Measure	N/A
	Subtotal	**77,721**	**16.56%**
Transportation and Mobility Strategy			
LU-22	Natural and visual resources are valued resources to maintain the rural character of the Los Alamos Hills.	Supporting Measure	N/A
LU-24	Historic Murrieta as the City's cultural, civic and community center.	Supporting Measure	N/A
LU-25	Collaboration with Federal, State, County, and other regional agencies and authorities to ensure compliance with existing and future legislation that affects the City of Murrieta.	Supporting Measure	N/A
CIR-1	A circulation system that serves the internal circulation needs of the City, while also addressing the inter-community or through travel needs.	7,470	1.59%
CIR-2	A comprehensive circulation system that promotes safety.	14,939	3.18%
CIR-5	A supported regional transportation system that serves existing and future travel between Murrieta and other population and employment centers within southwest Riverside County and the larger region, and that accommodates the regional travel needs of developing areas outside the City.	1,867	0.40%

Table 3-4 [continued]
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
CIR-6	Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.	37,345	7.96%
CIR-7	Residential areas and activity centers are accessible to all pedestrians, including persons with disabilities or having special accessibility needs.	934	0.20%
CIR-8	Development, expansion, and maintenance of a network of bicycle, pedestrian, and multi-use trails that allows residents to travel between parks, schools, neighborhoods, and other major destinations without driving.	6,536	1.39%
AQ-4	Mobile source emissions are reduced by providing a balance of jobs and housing that serve the needs of the community.	18,674	3.98%
AQ-5	Air quality is improved through an efficient circulation system, reduced traffic congestion, and reduced vehicle miles traveled.	47	0.01%
	Subtotal	**87,812**	**18.77%**
Energy Use and Conservation Strategy			
CSV-12	Energy conservation and the generation of energy from renewable sources is prioritized as part of an overall strategy to reduce greenhouse gas emissions.	54,588	11.63%
CSV-14	A community that encourages and incentivizes the sustainable development of buildings and neighborhoods, particularly with respect to durability, energy and water use, and transportation impacts.	120,120	25.59%
Housing Element Goal 2	Conserve and enhance the quality of existing housing and residential neighborhoods in Murrieta.	Supporting Measure	N/A
	Subtotal	**174,708**	**37.22%**
Water Use and Efficiency Strategy			
INF-2	Infrastructure for recycled water is expanded throughout Murrieta for irrigation and other non-potable uses.	4,019	0.86%
CSV-1	A community that conserves, protects, and manages water resources to meet long-term community needs, including surface waters, groundwater, imported water supplies, storm water, and waste water.	10,097	2.15%
CSV-2	Murrieta promotes compliance with requirements from the State and appropriate agencies regarding comprehensive water conservation measures in buildings and landscaping.	Supporting Measure	N/A
	Subtotal	**14,116**	**3.01%**

Table 3-4 [continued]
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
Waste Reduction and Recycling Strategy			
INF-1	New development and redevelopment is coordinated with the provision of adequate infrastructure for water, sewer, storm water, and energy.	Supporting Measure	N/A
CSV-13	Solid waste is diverted from landfills through waste reduction, re-use and recycling.	7,009	1.50%
	Subtotal	**7,009**	**1.49%**
Open Space Strategy			
CSV-9	A community that promotes the growth of an urban forest and water-efficient landscaping, recognizing that plants provide natural services such as habitat, storm water management, soil retention, air filtration, and cooling, and also have aesthetic and economic value.	1,590	0.34%
CSV-10	Fresh food is grown locally and made available through multiple venues that maintain a link to the City's agricultural heritage and promote healthy eating.	Supporting Measure	N/A
ROS-7	Open space areas are planned to protect, conserve, and utilize resources of unique character and value for the community.	Supporting Measure	N/A
ROS-8	New development is part of a coordinated system of open space, parkland, recreation facilities, and trails.	Supporting Measure	N/A
ROS-9	Public plazas or green spaces provide additional open space opportunities for existing and future residents and employees.	Supporting Measure	N/A
	Subtotal	**1,590**	**0.34%**
Statewide Reductions			
	SB 1078 and SB 107	53,691	11.44%
	AB 1493 and EO S-1-07	52,389	11.16%
	Subtotal Statewide Reductions	**106,080**	**22.60%**
	Total Reductions	**469,386**	**100%**
		15.21% from 2009 baseline	


Potential GHG Emissions Reductions from 2020 Business as Usual Scenario
Community Involvement 0.07%
Land Use and Community Vision 16.56%
Transportation and Mobility 18.71%
Energy Use and Conservation 37.22%
Water and Energy Use 3.01%
Waste Reduction and Recycling 1.49%
Open Space 0.34%
Statewide Reductions 22.60%

Chapter 4

Implementation

Chapter 4 Implementation

APPROACH

The Climate Action Plan (CAP) strategies for reducing GHG emissions and adapting to climate change are described only at a schematic level of detail in Chapter 3, *Climate Action Strategies*. While this level of detail is sufficient for some strategies, others will require an additional, more in-depth round of planning prior to implementation. In this later round of planning, strategies will be described in more detail, including specific priorities for implementation, costs, funding sources, and staffing. A major concern with implementing the CAP is limitations on funding and staffing. Due to the current state of the economy, it is essential to focus the CAP on affordable solutions while implementing strategies that will move the City closer to the GHG reduction goal of the CAP. By taking a realistic approach and setting achievable goals, the City will increase its chances of implementing a successful plan and demonstrating tangible progress in the future.

Public education is by far the most powerful and affordable tool to overcome this hurdle. In addition to the programs and policies the City has already put in place or is in the process of developing under the General Plan Update, strategies may include incorporating relevant information and ideas in existing publications and events, such as the City's website. The schools can be a powerful instrument for change, and working with schools on climate change education programs is considered an essential strategy. Additionally, much can be accomplished by supporting community groups interested in promoting and implementing the CAP.

The CAP provides a high-level road map to begin the community's transition to a low-carbon future. It provides a critical foundation for action, but it is only a first step. Moving forward, the City will need to take specific steps to advance and monitor the CAP's implementation. These include:

1. **Assign Responsibility.** Designate a city-wide climate change staff liaison to coordinate and implement the CAP and associated measures. Resources should also be (such as funding and staff) to assist with implementing and ensuring that climate change-related considerations are included as requirements in all relevant decision making processes (e.g., the entitlement process). It is critical that the City clearly assign responsibility for the City's carbon budget and implementation of the CAP roadmap to achieve the goals for 2020. Training and support will be required to ensure city staff has the necessary skills and expertise to understand and manage emissions within and between sectors to support a break from business-

as-usual for municipal and community-wide practices. Now that the City is a member of ICLEI, this can be accomplished through their Climate Resiliency process.

2. **Study the Costs and benefits of the CAP Implementation.** Conduct a formal cost estimation study for the most effective emission reduction strategies identified in the CAP.

3. **Develop and Implement a Performance Monitoring Process.** To ensure the community stays on course to meet GHG reduction targets, it is ultimately necessary to track progress by conducting regular inventories and monitoring procedures. This should be done on an annual basis, with the results presented to the City Council.

4. **Communication and Collaboration.** Work with energy utilities to create durable and interoperable exchanges of city-wide energy performance data. The City should also partners with local, regional, and state agencies to ensure collaboration and achieve future reduction goals.

Chapter 5

Public Participation

Chapter 5
Public Participation

Murrieta residents have played an important role in the formulation of this Climate Action Plan (CAP) through the City's General Plan Update community workshops. Community members provided their input and have stressed several points of change they would like to see in their City. Community support is vital to the success of this CAP and community members will need to take an active role in implementing the CAP and monitoring its success over time.

COMMUNITY OUTREACH THROUGH WORKSHOPS AND SURVEYS

A variety of outreach tools allowed all who wished to participate to do so in a manner with which they felt comfortable. Outreach efforts included a web-based community survey and several community workshops. The community workshops included presentations, surveys, group activities, and comments. The General Plan Update website, www.murrietaplan.info, provided the public with information on past and upcoming events, as well as links to documents and reports.

The City conducted three General Plan community visioning workshops in January 2010. On January 22, 2010, the City held a workshop and collected input from forty-eight students from Vista Murrieta High School. On January 28 and 30, 2010, the City held workshops attended by over sixty community members. Ten meetings were held from March through June focusing on community involvement in the development of the Land Use Alternatives in each of the focus areas and to refine the vision and community priorities. Opinions were also gathered through several online surveys throughout the General Plan Update process.

Community members participated in small group discussion and presentation sessions, a 'Treasures, Challenges, and Visions' Post-it Note exercise, surveys, and open discussions. The information gathered from these meetings and surveys was used to formulate goals and policies in the General Plan Update, as well as the strategies and actions in the CAP. Through the workshops and surveys, community members have provided valuable input that has been used to select GHG reduction measures.

KEY FINDINGS

The following topics were brought to light through public outreach and various reports.

Sustainable Economy. One of ten community priorities developed through the community visioning workshops is to *"pursue economic vitality and longevity by attracting higher education and growing a base of clean industry, while maintaining the current housing affordability."*

Community members expressed a desire for economic development that would lead to more jobs, including high-paying jobs and jobs for teens, and fully occupied retail centers. Participants hoped to see development in the Golden Triangle. They noticed local signs of the economic downturn, expressing concerns about commercial vacancies, foreclosures, and lower housing values. However, participants also considered the affordability of housing in Murrieta to be an asset.

To stimulate economic development, workshop groups suggested providing higher education, infrastructure, and incentives, as well as promoting downtown. One group felt that high-speed rail could provide an opportunity. Another group suggested constructing office buildings for large employers. Some areas of growth the groups identified were medical and bio-tech industries, "green" businesses, mixed use, and hotels. Hotel locations were suggested near the Loma Linda University Medical Center and in the Golden Triangle, north of Murrieta Hot Springs Road. Participants saw opportunities for Murrieta due to assets such as freeway access and an educated workforce.

Participants recognized the role of the City and the General Plan in directing land use and growth. They expressed the need to manage growth in order to provide adequate infrastructure and services, or to preserve certain qualities of the community that they value.

Comments also pertained to the residents' desire for a sustainable economy including a vision for "a thriving, well planned community with an ability to attract well paying professional jobs." Residents also wanted to have the "opportunity to live, work, grow old, [and] recreate" within Murrieta and for the City to attract "high end industry – health care, clean energy/water businesses, and tourism." Residents would like their City to target green industries with extra incentives to locate there.

Economic development is strongly linked to two other major themes of the General Plan Update: sustainability, and becoming a healthy community. Commuting is one example of a connection between these themes. When there are more jobs available closer to home, Murrieta residents can reduce the amount of time that they spend commuting. This would reduce emissions from vehicle travel, which benefits both the environment and human health. It would also provide residents with more time to spend in healthy activities with their families.

Commuting to Work. Residents have shown a concern for their jobs/housing balance and would like to see more job opportunities within Murrieta. According to 2008 US Census data cited in the *Economic Trends and Conditions* study prepared by Stanley R. Hoffman Associates, Inc.,(January 7, 2010), about 13 percent of individuals employed in Murrieta, live in Murrieta. In comparison, an overwhelming majority of Murrieta residents (87 percent) commute out of the City for work. Sixteen percent of residents commute to Temecula for work, 20 percent commute to other parts of Riverside County, and 22 percent commute to San Diego County.

Transportation. Another community priority pertains to transportation. Residents would like to see the City *"improve roadway networks to reduce traffic, and provide a citywide system of bicycle lanes and recreational trails that improve accessibility without a car."*

Transportation systems are important to Murrieta residents to help them reach other regional destinations and to travel within the City. Participants said that Murrieta was conveniently located, but many would rather be able to work, shop, dine, and recreate in Murrieta instead of driving out of town. Time spent in the car is clearly an issue for Murrieta residents, with many participants citing traffic as a concern on local streets and freeway interchanges. As individuals and in groups, participants suggested more connections for Clinton Keith Road, Diaz Road, Winchester Road, Washington Avenue, and Ynez Road, as well as more freeway overpasses and north/south connectivity to Temecula.

Community members also hoped to see a City-wide system of bicycle lanes. They sought recreational trails (including equestrian trails) that connect parks and open space, hoping that they could access these amenities without needing to drive. As discussed in the Natural Environment section above, a workshop group proposed a park with trails along the river from Wildomar to Temecula. Another group echoed this group's suggestion of linking trails to Old Town. Groups discussing transportation also suggested developing other modes of transportation: Safe Routes to School, wheelchair-accessible connectivity, a trolley, golf carts in Old Town, improved bus service, and rail connections to San Diego and Orange County.

The addition of a well connected trail network and better public transportation was a common theme throughout the community workshops. Community member comments included the desire for "Implementing a safe and well connected bike path system" and that "transit lines should be included on major north/south corridors and major east/west corridors." Another community member commented that: "We are there when I can walk and get on a trail within 5 to10 minutes from home."

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the future of southern california
Murrieta
General Plan Update

Appendix

ICLEI Clean Air Climate Protection (CACP) Software (Version 2.2.1b) Input Summary

City of Murrieta

Year 2009 Baseline

COMMUNITY

	Electricity (kWh)	Natural Gas (thousand cu ft)
Residential		
Rural Residential	3,055,190	3,619
Single Family	157,890,843	187,033
Multi-Family	22,686,048	16,174
NonResidential		
Commercial	93,077,067	356,532
Industrial	4,256,340	29,354
Business Park	9,406,149	77,195
Civic/Institutional	13,249,690	64,829
Office	25,947,111	49,011

Transportation

	Annual Vehicle Miles Traveled				
Facility Type	Total VMT	Heavy Duty Vehicles (diesel)	Heavy Duty Vehicles (gasoline)	Light Trucks (gasoline)	Passenger cars (gasoline)
Freeway Ramps	19,167,245	345,010	555,850	7,858,570	10,407,814
Principal Arterial	79,936,225	1,438,852	2,318,151	32,773,852	43,405,370
Minor Arterial	133,760,854	2,407,695	3,879,065	54,841,950	72,632,144
Major Collector	71,268,884	1,282,840	2,066,798	29,220,242	38,699,004
Minor Collector	9,604,128	172,874	278,520	3,937,692	5,215,042
Total	*313,737,336*	*5,647,272*	*9,098,383*	*128,632,308*	*170,359,373*

Waste (tons)	
Residential	25,865
Non Residential	32,918
Total	*58,783*

	Residential	Non Residential
Paper	27.5%	31.1%
Food Waste	20.0%	18.2%
Plant Debris	10.5%	31.2%
Wood or Textiles	14.5%	17.3%
Other	27.5%	2.2%

MUNICIPAL

Energy Usage	Electricity	Natural Gas
Municipal Buildings	842,136 kWh	18,501 therms (data from city)
Streetlights and Traffic Signa	17,500 MWh	N/A
Water Delivery/Treatment	54,835 MWh	N/A
Wastewater	13,950 MWh	N/A

Municipal Vehicle Fleet	Vehicle Miles
Heavy Duty Vehicles (diesel)	179,600
Passenger Cars (gasoline)	2,065,400
Employee Commute	
Passenger Cars (gasoline)	3,733,600

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						
Murrieta, California						
Multi-Family						
Electricity	10,872	250	658	10,918	2.5	77,427
Natural Gas	973	4	183	976	0.2	16,643
Subtotal Multi-Family	11,846	253	841	11,894	2.8	94,070
Rural Residential						
Electricity	1,464	34	89	1,470	0.3	10,427
Natural Gas	218	1	41	218	0.1	3,724
Subtotal Rural Residential	1,682	34	130	1,689	0.4	14,151
Single Family						
Electricity	75,668	1,737	4,579	75,986	17.7	538,877
Natural Gas	11,257	42	2,121	11,285	2.6	192,457
Subtotal Single Family	86,925	1,779	6,700	87,271	20.3	731,334
Subtotal Residential	100,453	2,067	7,671	100,853	23.5	839,555
Commercial						
Murrieta, California						
Business Park						
Electricity	4,508	103	273	4,527	1.1	32,103
Natural Gas	4,646	18	876	4,658	1.1	79,434
Subtotal Business Park	9,154	121	1,148	9,185	2.1	111,537
Civic/Institutional						
Electricity	6,350	146	384	6,376	1.5	45,221
Natural Gas	3,902	15	735	3,912	0.9	66,709
Subtotal Civic/Institutional	10,252	160	1,120	10,288	2.4	111,930

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Commercial						
Electricity	44,607	1,024	2,699	44,794	10.4	317,669
Natural Gas	21,458	81	4,044	21,513	5.0	366,871
Subtotal Commercial	66,065	1,105	6,743	66,307	15.4	684,541
Office						
Electricity	12,435	285	752	12,487	2.9	88,557
Natural Gas	2,950	11	556	2,957	0.7	50,432
Subtotal Office	15,385	297	1,308	15,444	3.6	138,989
Subtotal Commercial	100,855	1,683	10,320	101,224	23.6	1,046,996
Industrial						
Murrieta, California						
Industrial						
Electricity	2,040	47	123	2,048	0.5	14,527
Natural Gas	1,767	7	67	1,768	0.4	30,205
Subtotal Industrial	3,806	53	190	3,817	0.9	44,732
Subtotal Industrial	3,806	53	190	3,817	0.9	44,732
Transportation						
Murrieta, California						
Freeway Ramps						
Diesel	612	4	4	613	0.1	7,594
Gasoline	11,803	1,551	1,334	12,057	2.8	151,059
Subtotal Freeway Ramps	12,415	1,555	1,338	12,670	2.9	158,653
Major Collector						
Diesel	2,277	14	14	2,279	0.5	28,237
Gasoline	43,885	5,768	4,961	44,831	10.4	561,678
Subtotal Major Collector	46,162	5,782	4,976	47,110	11.0	589,915

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Minor Arterial						
Diesel	4,273	25	27	4,278	1.0	52,997
Gasoline	82,365	10,826	9,311	84,141	19.6	1,054,183
Subtotal Minor Arterial	86,639	10,851	9,339	88,419	20.6	1,107,180
Minor Collector						
Diesel	307	2	2	307	0.1	3,805
Gasoline	5,914	777	669	6,041	1.4	75,691
Subtotal Minor Collector	6,221	779	671	6,349	1.5	79,496
Principal Arterial						
Diesel	2,554	15	16	2,556	0.6	31,671
Gasoline	49,222	6,470	5,565	50,283	11.7	629,986
Subtotal Principal Arterial	51,776	6,485	5,581	52,839	12.3	661,657
Subtotal Transportation	203,212	25,452	21,904	207,387	48.3	2,596,901
Waste						
Murrieta, California						
Non Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	521,201	5,473	1.3	
Food Waste	0	0	172,648	1,813	0.4	
Plant Debris	0	0	167,715	1,761	0.4	
Wood or Textiles	0	0	82,055	862	0.2	
Subtotal Non Residential	0	0	943,620	9,908	2.3	
Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	362,124	3,802	0.9	
Food Waste	0	0	149,073	1,565	0.4	
Plant Debris	0	0	44,349	466	0.1	
Wood or Textiles	0	0	54,039	567	0.1	
Subtotal Residential	0	0	609,585	6,401	1.5	
Subtotal Waste	0	0	1,553,206	16,309	3.8	
Total	408,325	29,255	1,593,290	429,589	100.0	4,528,184

Government Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities							
Murrieta, California							
Municipal Buildings							
Electricity	404	9	24	405	0.9	2,874	0
Natural Gas	108	0	20	108	0.2	1,850	0
Subtotal Municipal Buildings	512	10	45	514	1.1	4,724	0
Subtotal Buildings and Facilities	512	10	45	514	1.1	4,724	0
Streetlights & Traffic Signals							
Murrieta, California							
Streetlights, Traffic Signals							
Electricity	8,387	193	508	8,422	18.6	59,727	0
Subtotal Streetlights, Traffic Si	8,387	193	508	8,422	18.6	59,727	0
Subtotal Streetlights & Traffic Si	8,387	193	508	8,422	18.6	59,727	0
Water Delivery Facilities							
Murrieta, California							
Water Pumping, Treatment, Delivery							
Electricity	26,279	603	1,590	26,390	58.2	187,150	0
Subtotal Water Pumping, Treat	26,279	603	1,590	26,390	58.2	187,150	0
Subtotal Water Delivery Facilities	26,279	603	1,590	26,390	58.2	187,150	0
Wastewater Facilities							
Murrieta, California							
Wastewater							
Electricity	6,685	153	405	6,714	14.8	47,611	0
Subtotal Wastewater	6,685	153	405	6,714	14.8	47,611	0
Subtotal Wastewater Facilities	6,685	153	405	6,714	14.8	47,611	0

Government Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Vehicle Fleet							
Murrieta, California							
Heavy Duty Vehicles							
Diesel	319	2	2	319	0.7	3,953	0
Subtotal Heavy Duty Vehicles	319	2	2	319	0.7	3,953	0
Passenger Cars							
Gasoline	1,038	134	127	1,060	2.3	13,280	0
Subtotal Passenger Cars	1,038	134	127	1,060	2.3	13,280	0
Subtotal Vehicle Fleet	1,356	136	129	1,379	3.0	17,233	0
Employee Commute							
Murrieta, California							
Passenger Cars							
Gasoline	1,876	242	229	1,916	4.2	24,006	0
Subtotal Passenger Cars	1,876	242	229	1,916	4.2	24,006	0
Subtotal Employee Commute	1,876	242	229	1,916	4.2	24,006	0
Total	45,095	1,337	2,905	45,333	100.0	340,451	0

ICLEI Clean Air Climate Protection (CACP) Software (Version 2.2.1b) Input Summary

City of Murrieta

Year 2035

COMMUNITY

	Electricity (kWh)	Natural Gas (thousand cu ft)
Residential		
Rural Residential	5,497,091	6,512
Single Family	177,690,497	210,487
Multi-Family	67,101,639	47,841
NonResidential		
Commercial	226,510,735	867,651
Industrial	6,517,605	44,949
Business Park	49,606,156	407,113
Civic/Institutional	9,814,300	48,020
Office	317,651,090	600,008
Mixed-Use	13,107,565	29,887

Transportation

		Annual Vehicle Miles Traveled			
Facility Type	Total VMT	Heavy Duty Vehicles (diesel)	Heavy Duty Vehicles (gasoline)	Light Trucks (gasoline)	Passenger cars (gasoline)
Freeway Ramps	3,694,895	66,508	107,152	1,514,907	2,006,328
Principal Arterial	374,483,857	6,740,709	10,860,032	153,538,381	203,344,734
Minor Arterial	353,264,159	6,358,755	10,244,661	144,838,305	191,822,438
Major Collector	30,415,592	547,481	882,052	12,470,393	16,515,667
Minor Collector	12,883,361	231,901	373,617	5,282,178	6,995,665
Total	*774,741,864*	*13,945,354*	*22,467,514*	*317,644,164*	*420,684,832*

Waste (tons)	
Residential	21,824
Non Residential	67,619
Total	*89,443*

	Residential	Non Residential
Paper	27.5%	31.1%
Food Waste	20.0%	18.2%
Plant Debris	10.5%	31.2%
Wood or Textiles	14.5%	17.3%
Other	27.5%	2.2%

MUNICIPAL

Energy Usage	Electricity	Natural Gas
Municipal Buildings	926,350 kWh	20,351 therms (data from city)
Streetlights and Traffic Signals	20,125 MWh	N/A
Water Delivery/Treatment	70,270 MWh	N/A
Wastewater	18,135 MWh	N/A

Municipal Vehicle Fleet	Vehicle Miles
Heavy Duty Vehicles (diesel)	197,560
Passenger Cars (gasoline)	2,271,940
Employee Commute	
Passenger Cars (gasoline)	4,106,960

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						
Murrieta, California						
Multi-Family						
Electricity	32,158	738	1,946	32,293	2.2	229,016
Natural Gas	2,879	11	543	2,887	0.2	49,228
Subtotal Multi-Family	35,037	749	2,489	35,180	2.4	278,244
Rural Residential						
Electricity	2,634	60	159	2,645	0.2	18,761
Natural Gas	392	1	74	393	0.0	6,701
Subtotal Rural Residential	3,026	62	233	3,038	0.2	25,462
Single Family						
Electricity	85,157	1,955	5,153	85,514	5.8	606,452
Natural Gas	12,668	48	2,388	12,701	0.9	216,591
Subtotal Single Family	97,825	2,002	7,541	98,215	6.7	823,043
Subtotal Residential	135,889	2,813	10,262	136,433	9.3	1,126,750
Commercial						
Murrieta, California						
Business Park						
Electricity	23,774	546	1,439	23,873	1.6	169,304
Natural Gas	24,502	92	4,618	24,565	1.7	418,919
Subtotal Business Park	48,276	638	6,056	48,438	3.3	588,224
Civic/Institutional						
Electricity	4,703	108	285	4,723	0.3	33,496
Natural Gas	2,890	11	545	2,897	0.2	49,413
Subtotal Civic/Institutional	7,594	119	829	7,621	0.5	82,908

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Commercial						
Electricity	108,554	2,492	6,569	109,009	7.4	773,074
Natural Gas	52,219	197	9,842	52,353	3.6	892,813
Subtotal Commercial	160,774	2,688	16,410	161,363	11.0	1,665,887
Mixed-Use						
Electricity	6,282	144	380	6,308	0.4	44,736
Natural Gas	1,799	7	339	1,803	0.1	30,754
Subtotal Mixed-Use	8,080	151	719	8,111	0.6	75,489
Office						
Electricity	152,233	3,494	9,212	152,871	10.4	1,084,133
Natural Gas	433,336	1,633	81,669	434,447	29.5	7,408,894
Subtotal Office	585,569	5,128	90,881	587,318	39.9	8,493,027
Subtotal Commercial	810,292	8,724	114,896	812,850	55.3	10,905,536
Industrial						
Murrieta, California						
Industrial						
Electricity	3,124	72	189	3,137	0.2	22,244
Natural Gas	2,705	10	102	2,708	0.2	46,253
Subtotal Industrial	5,829	82	291	5,845	0.4	68,497
Subtotal Industrial	5,829	82	291	5,845	0.4	68,497
Transportation						
Murrieta, California						
Freeway Ramps						
Diesel	118	1	1	118	0.0	1,464
Gasoline	2,170	299	257	2,219	0.2	27,777
Subtotal Freeway Ramps	2,288	300	258	2,337	0.2	29,241

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Major Collector						
Diesel	972	6	6	973	0.1	12,051
Gasoline	17,865	2,462	2,117	18,269	1.2	228,651
Subtotal Major Collector	18,837	2,467	2,123	19,241	1.3	240,702
Minor Arterial						
Diesel	11,286	67	71	11,297	0.8	139,965
Gasoline	207,494	28,591	24,592	212,184	14.4	2,655,689
Subtotal Minor Arterial	218,780	28,658	24,663	223,481	15.2	2,795,653
Minor Collector						
Diesel	412	2	3	412	0.0	5,104
Gasoline	7,567	1,043	897	7,738	0.5	96,852
Subtotal Minor Collector	7,979	1,045	899	8,150	0.6	101,956
Principal Arterial						
Diesel	11,964	71	76	11,976	0.8	148,372
Gasoline	219,957	30,309	26,069	224,929	15.3	2,815,209
Subtotal Principal Arterial	231,921	30,380	26,145	236,905	16.1	2,963,581
Subtotal Transportation	479,805	62,851	54,089	490,115	33.3	6,131,133
Waste						
Murrieta, California						
Non Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	1,070,634	11,242	0.8	
Food Waste	0	0	354,648	3,724	0.3	
Plant Debris	0	0	344,515	3,617	0.2	
Wood or Textiles	0	0	168,555	1,770	0.1	
Subtotal Non Residential	0	0	1,938,352	20,353	1.4	

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	305,548	3,208	0.2	
Food Waste	0	0	125,783	1,321	0.1	
Plant Debris	0	0	37,420	393	0.0	
Wood or Textiles	0	0	45,596	479	0.0	
Subtotal Residential	0	0	514,347	5,401	0.4	
Subtotal Waste	0	0	2,452,699	25,753	1.8	
Total	1,431,815	74,470	2,632,237	1,470,996	100.0	18,231,916

Government Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities							
Murrieta, California							
Municipal Buildings							
Electricity	444	10	27	446	0.8	3,162	0
Natural Gas	119	0	22	119	0.2	2,035	0
Subtotal Municipal Buildings	563	11	49	565	1.0	5,197	0
Subtotal Buildings and Facilities	563	11	49	565	1.0	5,197	0
Streetlights & Traffic Signals							
Murrieta, California							
Streetlights, Traffic Signals							
Electricity	9,645	221	584	9,685	17.3	68,686	0
Subtotal Streetlights, Traffic Si	9,645	221	584	9,685	17.3	68,686	0
Subtotal Streetlights & Traffic Si	9,645	221	584	9,685	17.3	68,686	0
Water Delivery Facilities							
Murrieta, California							
Water Pumping, Treatment, Delivery							
Electricity	33,677	773	2,038	33,818	60.3	239,829	0
Subtotal Water Pumping, Treat	33,677	773	2,038	33,818	60.3	239,829	0
Subtotal Water Delivery Facilities	33,677	773	2,038	33,818	60.3	239,829	0
Wastewater Facilities							
Murrieta, California							
Wastewater							
Electricity	8,691	199	526	8,728	15.6	61,894	0
Subtotal Wastewater	8,691	199	526	8,728	15.6	61,894	0
Subtotal Wastewater Facilities	8,691	199	526	8,728	15.6	61,894	0

Government Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Vehicle Fleet							
Murrieta, California							
Heavy Duty Vehicles							
Diesel	351	2	2	351	0.6	4,349	0
Subtotal Heavy Duty Vehicles	351	2	2	351	0.6	4,349	0
Passenger Cars							
Gasoline	1,036	147	139	1,061	1.9	13,266	0
Subtotal Passenger Cars	1,036	147	139	1,061	1.9	13,266	0
Subtotal Vehicle Fleet	1,387	149	141	1,412	2.5	17,614	0
Employee Commute							
Murrieta, California							
Passenger Cars							
Gasoline	1,874	266	252	1,918	3.4	23,980	0
Subtotal Passenger Cars	1,874	266	252	1,918	3.4	23,980	0
Subtotal Employee Commute	1,874	266	252	1,918	3.4	23,980	0
Total	55,836	1,620	3,590	56,125	100.0	417,201	0

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Statewide totals - 2020 (Statewide totals Avg Annual CYr 2020 Default Title)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	15,695,341	698,392	294.39	61.29	233.10	10.00%	23.31	209.79	0.07
LDT1	3,480,904	161,392	83.64	15.93	67.70	10.00%	6.77	60.93	0.02
LDT2	6,644,752	311,535	166.52	22.52	144.00	10.00%	14.40	129.60	0.04
MDV	2,953,681	140,340	101.86	13.33	88.53	10.00%	8.85	79.68	0.03
Total	**28,774,678**	**1,311,659**	**646.40**	**113.07**	**533.33**	**10.00%**	**53.33**	**479.99**	**0.15**

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Statewide totals - 2035 (Statewide totals Avg January CYr 2035 Default Title)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	18,479,622	1,025,651	419.35	136.28	283.07	10.00%	28.31	254.76	0.08
LDT1	4,387,662	258,883	131.06	41.29	89.77	10.00%	8.98	80.79	0.03
LDT2	8,241,417	482,146	253.89	57.87	196.02	10.00%	19.60	176.42	0.06
MDV	3,713,622	218,966	156.46	35.25	121.21	10.00%	12.12	109.09	0.03
Total	**34,822,323**	**1,985,646**	**960.75**	**270.69**	**690.07**	**10.00%**	**69.01**	**621.06**	**0.20**

Electricity Emissions Emissions Reductions from State Legislation

Sector	City-Wide Electricity Emissions (MTCO2eq) (Business as Usual)			Emissions with SB 1078 and SB 107		
				16% Renewabl	33% Renewable	33% Renewable
	2009	2020	2035	2009	2020	2035
Residential	80,172	92,483	109,272	80,172	76,761	90,696
Commercial	61,855	149,594	269,238	61,855	124,163	223,467
Industrial	1,858	2,276	2,846	1,858	1,889	2,362
Municipal	38,039	42,164	47,788	38,039	34,996	39,664
Total	*143,885*	*244,353*	*381,356*	*181,924*	*237,809*	*356,189*

GHG Inventory and Reductions

Community Emissions

	2009		2020		2035	
	$MTCO_2eq$	percent	$MTCO_2eq$	percent	$MTCO_2eq$	percent
Residential	91,492	23%	105,148	13%	123,770	9.3%
Commercial	91,829	24%	364,957	46%	737,405	55.3%
Industrial	3,463	1%	4,241	1%	5,302	0.4%
Transportation	188,138	48%	296,652	38%	444,625	33.3%
Waste	14,795	4%	18,420	2%	23,363	1.8%
Total	*389,717*	*100%*	*789,418*	*100%*	*1,334,465*	*100%*

Community	2020	2035
Reduction Target	458,159	1,003,205
Total Reduction	469,389	1,020,233

Total	2020	2035
Reduction Target	468,469	1,019,164
Total Reduction	469,389	1,020,233
Percent Reduction	0.1521	0.1525

Municipal Emissions

	2009		2020		2035	
	$MTCO_2eq$	percent	$MTCO_2eq$	percent	$MTCO_2eq$	percent
Buildings and Facilities	466	1%	486	1%	513	1%
Streetlights and Traffic Signals	7,640	19%	8,125	18%	8,786	17%
Water Delivery Facilities	23,941	58%	26,792	59%	30,679	60%
Wastewater Facilities	6,091	15%	6,864	15%	7,918	16%
Vehicle Fleet	1,251	3%	1,264	3%	1,281	3%
Employee Commute	1,738	4%	1,739	4%	1,740	3%
Total	*41,127*	100%	*45,269*	100%	*50,917*	100%

Community + Municipal Total	430,845	834,687	1,385,382
15%	*64,627*	*125,203*	*207,807*

			Estimated Annual Reduction ($MTCO_2eq$)	
Goal/Policy			2020	2035
STATE AND FEDERAL REDUCTIONS				
AB 1493 and EO S-1-07			52,389	91,859
17.66% reduction by 2020				
20.66% reduction by 2035				
SB 1079 and 107			53,691	80,419
33% RPS By 2020				
COMMUNITY INVOLVEMENT STRATEGY (Municipal Measures)				
CIR-6	Increase Public Education	Supporting Measure		
CSV-15	Reduce Municipal Emissions		97	103
20% energy efficiency retrofits by 2020				
40% energy efficiency retrofits by 2035				
HC-1	Green City Fleet		253	256
20% alt fuel vehicles by 2020				
50% alt fuel vehicles by 2035				

LAND USE STRATEGIES

LU-1	Balance Land Uses	18,674	44,462

Suburban Center: 10% reduction in VMT
CAPCOA 3.1.2 (p. 171)

Source: Holtzclaw, et al. 2002. Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use - Studies in Los Angeles and Chicago." Transportation Planning and Technology, Vol. 25, pp.1-27.

LU-4	Diverse Housing Stock	Supporting Measure

LU-5	Redevelopment - Create Local Employment Opportunities	3,641	8,670

39% VMT reduction for redevelopment

Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-6	Jobs/Housing - LU Policy that encourages job retention and attraction	52,288	124,495

Centeredness 40-60% reduction in commercial VMT
Victoria Transport Policy Institute, Online TDM Encyclopedia,Land Use Impact on Transport, November 2010.
http://www.vtpi.org/tdm/tdm20.htm

LU-7	Transit Oriented Development	Suipporting Measure

Discourage disjointed commercial development/strip malls
Shared Parking

Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-8	TOD - provide opportunities for mixed use and/or transit-oriented developr	784	1,867

21% TOD VMT Reduction
Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-9	Pedestrian-Friendly Environment	2,334	5,558

1% VMT reduction (CCAP)
Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-10	Pedestrian-Friendly Environment	Supporting Measure

ED-3	Sustainable Economy - Jobs/Housing Balance	Supporting Measure

Jobs housing balance
Increase ratio from 0.59 to 0.8 by 2020
Increase ratio to 1.0 by 2035

ED-4	Balance Retail and Demand for Goods	Supporting Measure

ED-5	Jobs Housing Balance	Supporting Measure

Flex-tech, and higher intensity along fwy corridors

ED-6	Highly Skilled Labor Force	Supporting Measure

Higher education institutions
Technical colleges

ED-8	Pursue office and R&D	Supporting Measure

ED-10	Economically Stable Historic Downtown	Supporting Measure

Higher density in downtown

AQ-6	Green Economy	Supporting Measure

Encourage non polluting industry and clean green tech to locate in the City

TRANSPORTATION AND MOBILITY STRATEGIES			
LU-22	Increase Trail Connectivity	Supporting Measure	
Trail masterplan Ped Linkages			
LU-24	Reduce Driving	Supporting Measure	
Expand traditional town dev pattern - grid streets Mixed use in downtown			
LU-25	High Speed Rail	Supporting Measure	
see CIR-5			
CIR-1	Multi-Modal Transportation	7,470	17,785
complete streets albany TL-1.1 4% VMT reduction Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
CIR-2	Pedestrian Safety	14,939	35,570
circulation and traffic calming improvements CAPCOA 3.2.2 1% of VMT			
CIR-5	Improve Public Transit	1,867	4,446
Metrolink - regional connections 1-2% reduction in VMT Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
CIR-6	Expand Transit Network	37,348	88,925
expand by 25% CAPCOA 3.5.3 Increase in transit ridership: 0.5% per 1% improvement in transit frequency Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
CIR-7	Increase Walking	934	2,223
Trails/ped connectivity			
CIR-8	Increase Trail Connectivity	6,536	15,562
coordinate multi-use trails trails along major home to work and other travel routes CAPCOA 3.2.9 Area-level VMT Reduction: 1-5% railstotrails.org, calbike.org Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
AQ-4	Jobs/Housing Balance	18,674	44,462
CAPCOA - Suburban Center 10% reduction			
AQ-5	Reduce Driving/efficient circulation, reduce congestion	47	111
CAPCOA 3.2.3 NEV Network (p 68, p205) Low penetration = 0.5% VMT reduction			

ENERGY USE AND CONSERVATION STRATEGY			
CSV-12	Renewable Energy and Efficiency	54,588	129,972
Provide information for incentives and rebates			
Develop improvements that achieve additional energy efficiency			
CSV-14	Green Building	120,120	285,999
include green buildnig standards			
Housing Element Goal 2	Energy Efficient Design	Supporting Measure	
Energy Conservation Ordinance			
WATER USE AND EFFICIENCY			
INF-2	Increase Use of Recycled Water (MUNI)	4,019	4,602
Expand recycled water infrastructure to cover 25 percent of the City by 2020			
(outdoor use only)			
CSV-1	Increase Water Conservation	10,097	11,579
Adopt water conservation strategy			
Green Building Code			
CSV-2	Reduce Water for Landscaping	Supporting Measure	
Adopt landscape water ordinance			
WASTE REDUCTION AND RECYCLING			
INF-1	Reduce Waste	Supporting Measure	
Education, informational, and outreach programs			
CSV-13	Increase Waste Diversion	7,009	17,522
increase waste stream diversion rate by 10% in 2020 and by 25% in 2035			
20 percent compost by 2020			
50 percent compost by 2035			
OPEN SPACE STRATEGY			
CSV-9	Increase Suburban Open Space	1,590	3,785
street trees, protect native trees			
Carbon sequestration, urban tree planting, CAPCOA 7.1.1 (p420)			
Plant urban shade trees CAPCOA 10.1.4			
Reduce urban heat island 10.1.5			
CSV-10	Improve Local Food	Supporting Measure	
CAPCOA 10.1.2			
Ros-7	Preserve Open Space	Supporting Measure	
Ros-8	Integrate New Development and Open Space	Supporting Measure	
Ros-9	Create New Open Space	Supporting Measure	